

**VOLUME II
FIGURES AND TABLES**

**EFFECTS OF DREDGED MATERIAL
BEACH DISPOSAL ON SURF ZONE
AND NEARSHORE FISH AND
BENTHIC RESOURCES ON BALD HEAD ISLAND,
CASWELL BEACH, OAK ISLAND, AND
HOLDEN BEACH, NORTH CAROLINA:
INTERIM STUDY FINDINGS**

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Contract No. DACW54-00-D-0001
Delivery Order No. 2

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March 2003

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METHODS

Table ME-1. General sampling plan for the beach disposal impact assessment for any given seasonal sampling time series. Dark shaded cells indicate stations that were impacted by the beach construction within a few days of sampling, light shaded cells indicate recovering stations, and non-shaded cells indicate stations sampled before beach construction.

	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Holden Beach Control
Trip 1 (Day 0)	X	X	X	X	X	X	X	X	X
Trip 2 (Day 14)	X	X	X	X	X	X	X	X	X
Trip 3 (Day 28)	X	X	X	X	X	X	X	X	X
Trip 4 (Day 42)	X	X	X	X	X	X	X	X	X

Table ME-2. Summary of number of benthic samples collected each seasonal sampling trip.

Zone	Sampling Trips Per Season	Stations (includes control site)	Transects Per Station	Samples Per Transect	Total Samples
Wrack	4	12	1	2	96
Swash	4	12	1	2	96
Shallow subtidal	4	12	1	2	96
Deep subtidal	4	12	1	2	96

Table ME-3. Summary of number of samples collected for larval, juvenile, and adult fish for each seasonal sampling trip.

Gear	Sampling Trips Per Season	Stations (includes control site)	Samples Per Station	Total Samples
Haul Seine	4	5	2	40
25-foot Trawl	4	5	2	40
Ichthyoplankton Net	2	5	2	20
Experimental Gill Nets	2	5	1	10

Table ME-4. Grain Size classification as categorized by Wentworth.

Mesh Size	U.S. Standard Sieve Size	Wentworth Size Category
4.75-mm	4	Pebble
2.00-mm	10	Granule
850-Fm	20	Very Coarse Sand
425-Fm	40	Coarse Sand
250-Fm	60	Medium Sand
106-Fm	140	Fine Sand
63-Fm	230	Very Fine Sand
-63-Fm		Silt/Clay

Table ME-5. Impact conditions of stations at Bald Head Island in spring 2001.
Stations 1-4 sampled on the first trip were replaced with Stations 11-14
in subsequent trips.

Trip	Dates When Trip Sampling Began	Station							
		5	6	7	8	11	12	13	14
Swash and Shallow Habitat									
1	4/2/01								
2	4/17/01								
3	4/30/01								
4	5/14/01								
Deep Habitat									
1	4/2/01								
2	4/17/01								
3	4/30/01								
4	5/14/01								
Seine									
1	4/2/01								
2	4/17/01								
3	4/30/01								
4	5/14/01								
Trawl									
1	4/2/01								
2	4/17/01								
3	4/30/01								
4	5/14/01								

Table ME-6. Impact dates of stations at Bald Head Island

	Station							
	5	6	7	8	11	12	13	14
Impact Date	5/22/01	5/21/01	5/5/01	5/5/01	5/5/01	4/18/01	4/15/01	3/25/01

Table ME-7. Impact conditions of stations at Caswell Beach in summer 2001

Trip	Dates When Trip Sampling Began	Station							
		21	22	23	24	25	26	27	28
Swash and Shallow Habitat									
1	7/16/01								
2	7/29/01								
3	8/13/01								
4	8/26/01								
Deep Habitat									
1	7/16/01								
2	7/29/01								
3	8/13/01								
4	8/26/01								
Seine									
1	7/16/01								
2	7/29/01								
3	8/13/01								
4	8/26/01								
Trawl									
1	7/16/01								
2	7/29/01								
3	8/13/01								
4	8/26/01								

Table ME-8. Impact dates of stations at Caswell Beach

	Station							
	21	22	23	24	25	26	27	28
Impact Date	7/16/01	7/18/01	7/19/01	7/19/01	7/20/01	7/21/01	7/22/01	7/24/01
Reimpact Date	8/8/01	8/8/01	8/9/01	8/10/01	8/12/01	8/13/01	8/14/01	8/15/01

Table ME-9. Impact conditions of stations at Oak Island in fall 2001

Trip	Dates When Trip Sampling Began	Station							
		41	42	43	44	45	46	47	48
Swash and Shallow Habitat									
1	10/29/01								
2	11/26/01								
3	12/10/01								
4	1/14/02								
Deep Habitat									
1	10/29/01								
2	11/26/01								
3	12/10/01								
4	1/14/02								
Seine									
1	10/29/01								
2	11/26/01								
3	12/10/01								
4	1/14/02								
Trawl									
1	10/29/01								
2	11/26/01								
3	12/10/01								
4	1/14/02								

Table ME-10. Impact dates of stations at Oak Island

	Station							
	41	42	43	44	45	46	47	48
Impact Date	11/1/01	11/7/01	11/21/01	11/24/01	11/28/01	12/2/01	12/3/01	12/5/01

Table ME-11. Impact conditions of stations at Holden Beach in winter 2002

Trip	Dates When Trip Sampling Began	Station							
		61	62	63	64	65	66	67	68
Swash and Shallow Habitat									
1	12/10/02								
2	1/14/02								
3	1/28/02								
4	2/11/02								
Deep Habitat									
1	12/10/02								
2	1/14/02								
3	1/28/02								
4	2/11/02								
Seine									
1	12/10/02								
2	1/14/02								
3	1/28/02								
4	2/11/02								
Trawl									
1	12/10/02								
2	1/14/02								
3	1/28/02								
4	2/11/02								

Table ME-12. Impact dates of stations at Holden Beach

	Station							
	64	63	62	61	65	66	67	68
Impact Date	12/20/01	12/26/01	1/1/02	1/13/02	1/15/02	1/17/02	1/20/02	1/23/02

6-II



Figure ME-1. Overview of beach monitoring study area

II-10

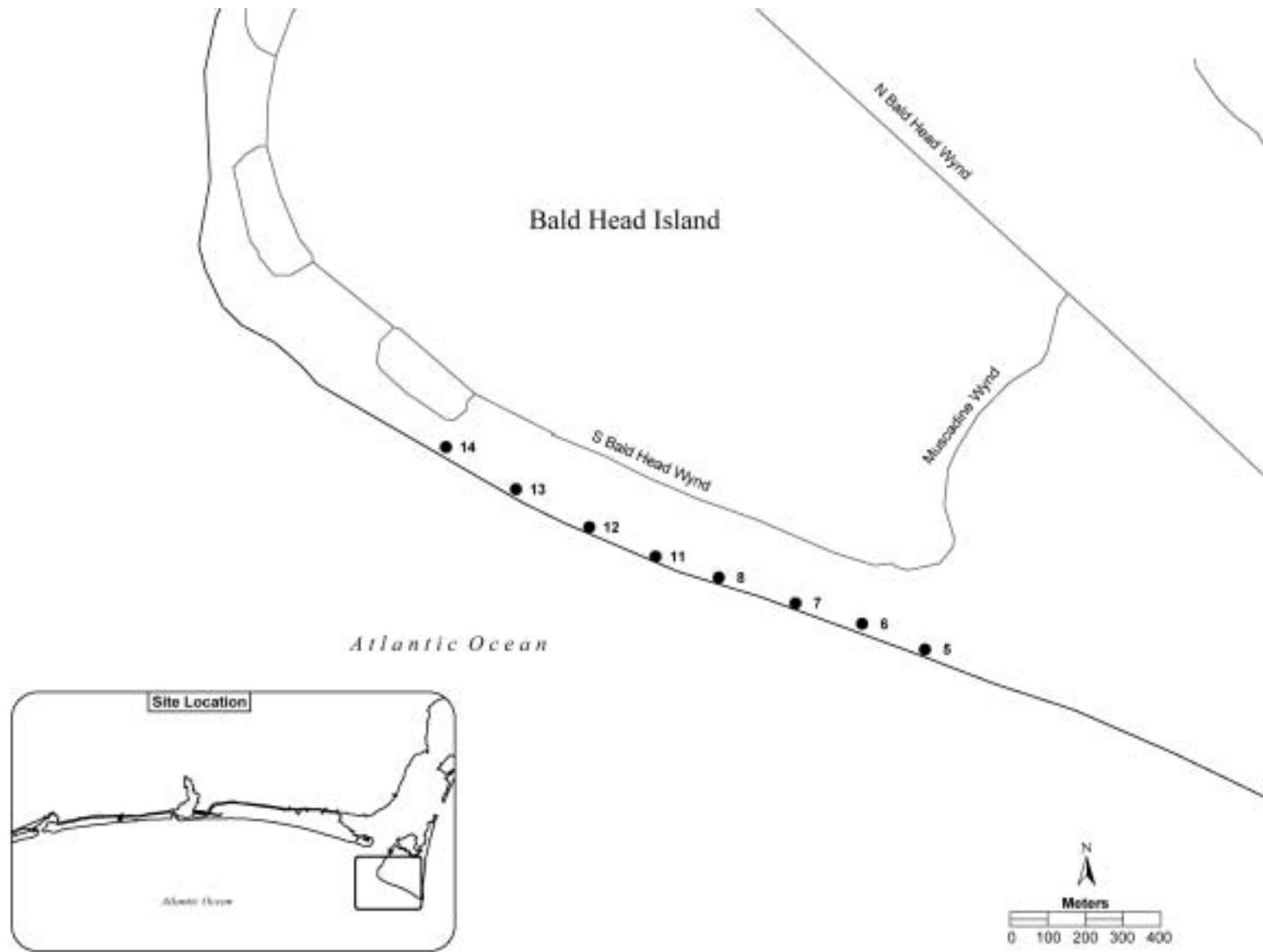


Figure ME-2. Swash station locations at Bald Head Island sampled in the spring 2001. Shallow and deep samples were taken along a transect leading out from the shoreline.

LL-II

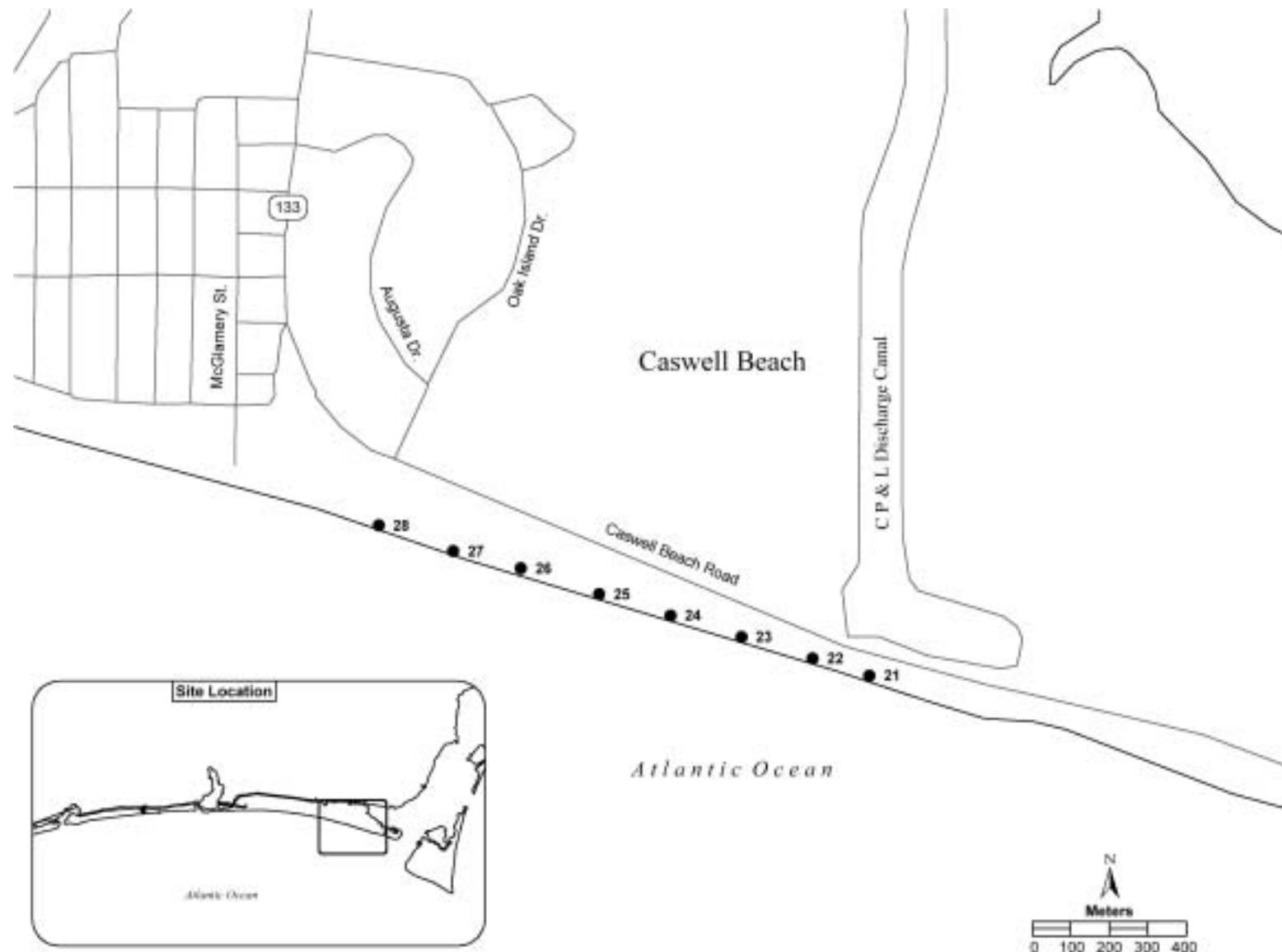


Figure ME-3. Swash sampling locations at Caswell Beach in the summer 2001. Shallow and deep samples were taken along a transect leading out from the shoreline.

II-12

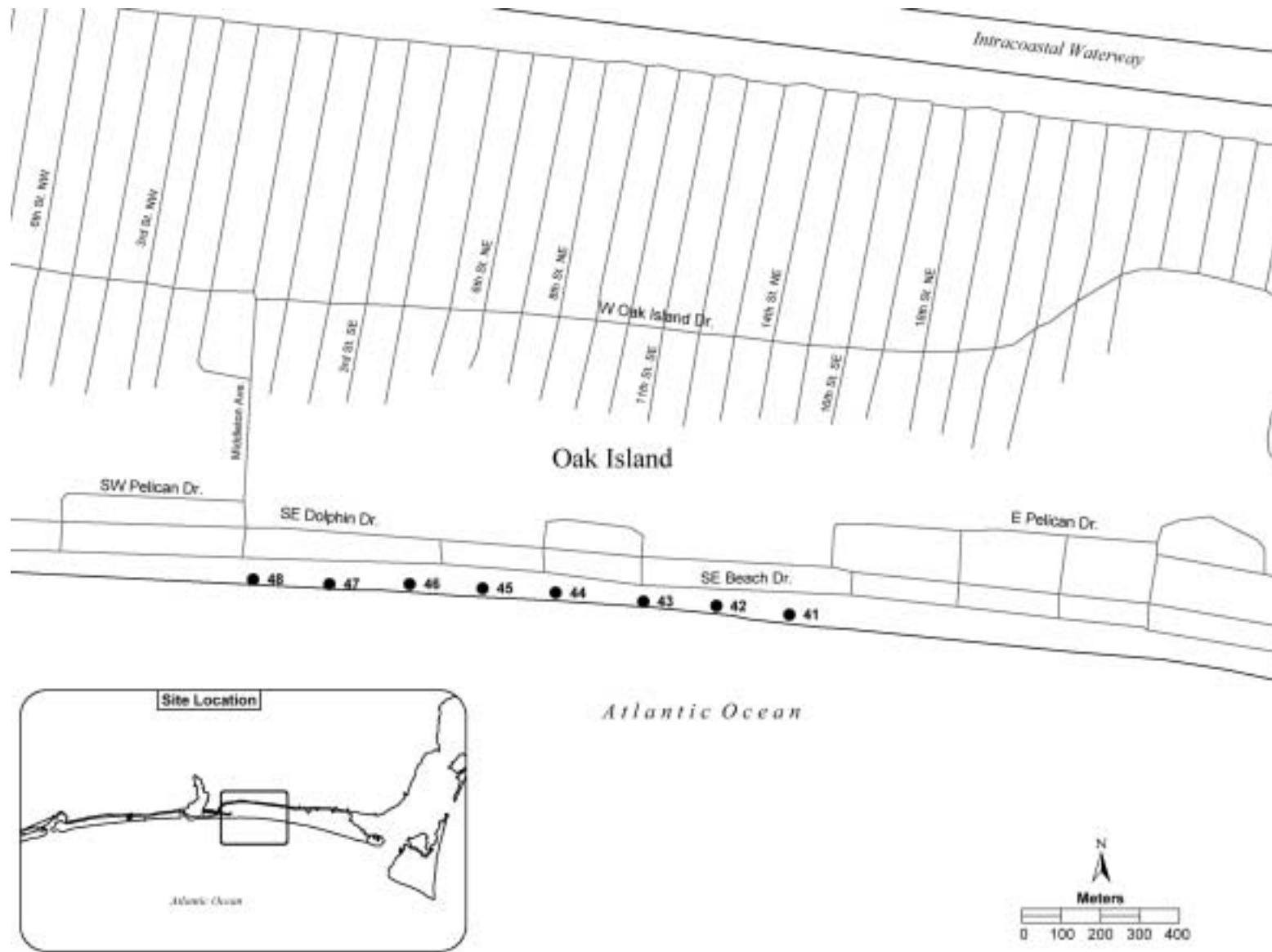


Figure ME-4. Swash station locations at Oak Island sampled in the fall 2001. Shallow and deep samples were taken along a transect leading out from the shoreline.

II-13

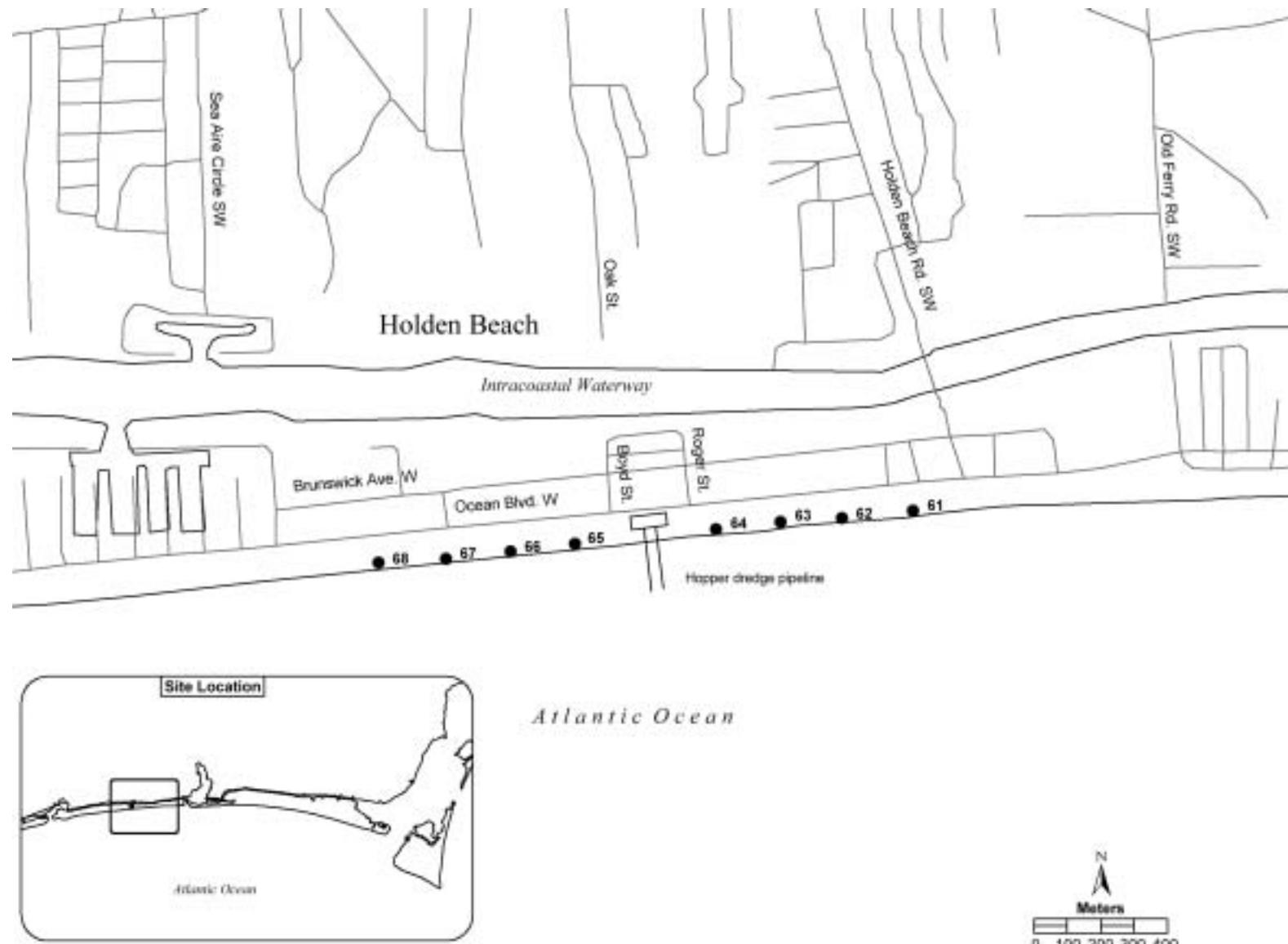


Figure ME-5. Swash station locations at Holden Beach sampled in the winter 2002. Shallow and deep samples were taken along a transect leading out from the shoreline.

II-14

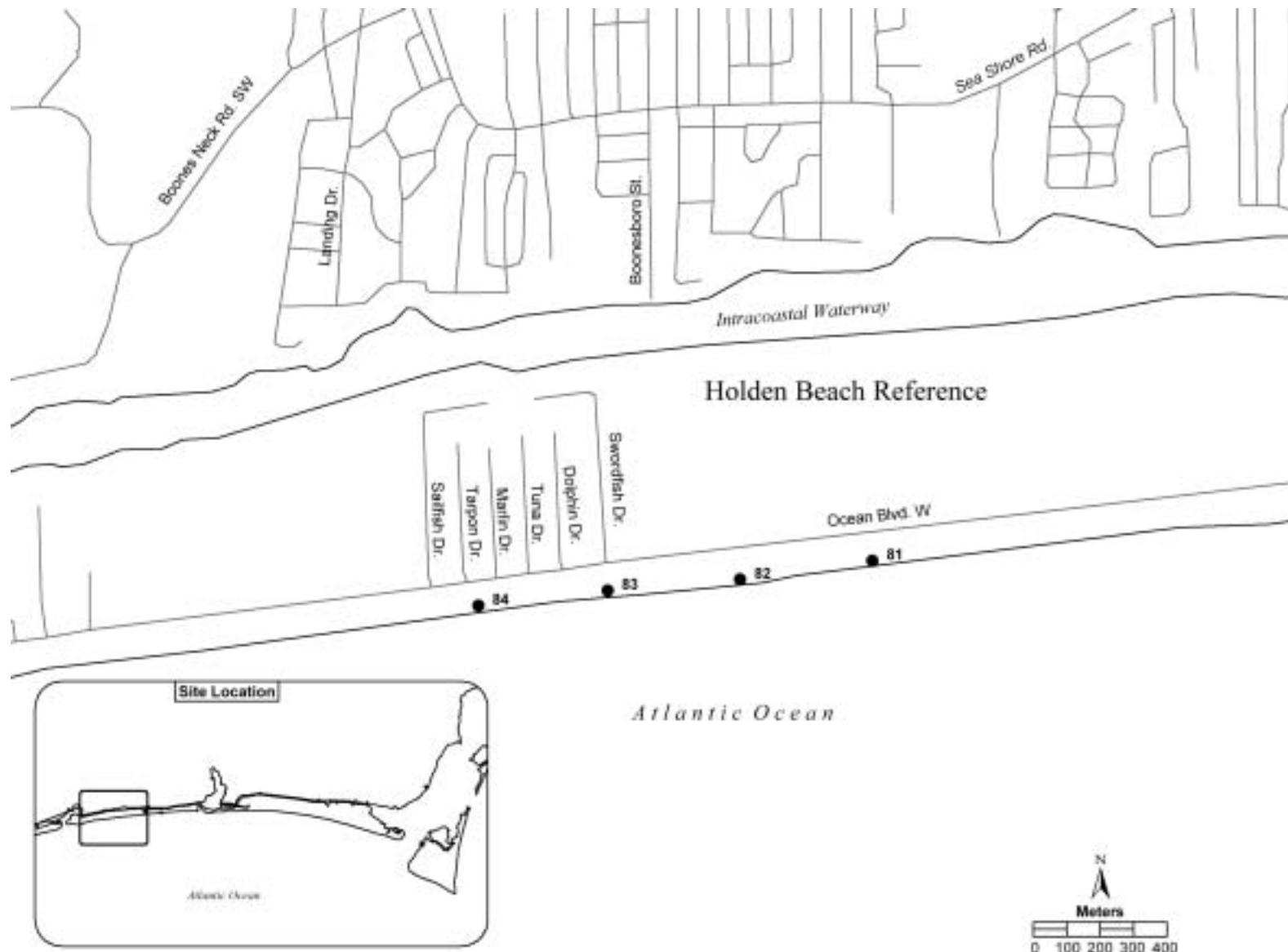


Figure ME-6. Swash station locations at the Holden Beach reference site. Shallow and deep samples were taken along a transect leaking out from the shoreline.

SWASH HABITAT

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Donax abundance
HABITAT:	Swash

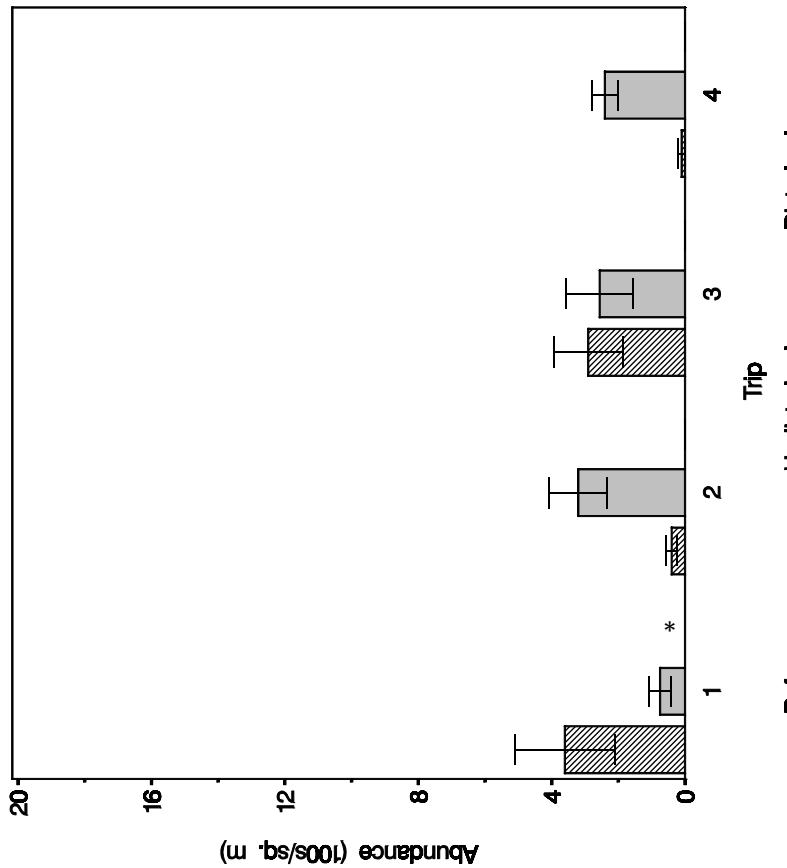


Figure SW-1. Mean and associated standard error of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SW-1. Mean (\bar{x}_i) and associated standard error (SE) of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (I)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	360.00	150.55	4	75.00	32.46	8			0			0.21
2	40.00	16.33	4	320.00	87.02	6	0.00	0.00	2	0.00	0.00	8.00
3	290.00	103.76	4	256.00	100.88	5	0.00	0.00	3	0.00	0.00	0.88
4	10.00	10.00	4	240.00	40.00	2	0.00	0.00	6	0.00	0.00	24.00
Spring	175.00	99.27		222.75	63.32		0.00	0.00	0.00	0.00	0.00	1.27

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: DONAX ABUNDANCE
HABITAT: SWASH

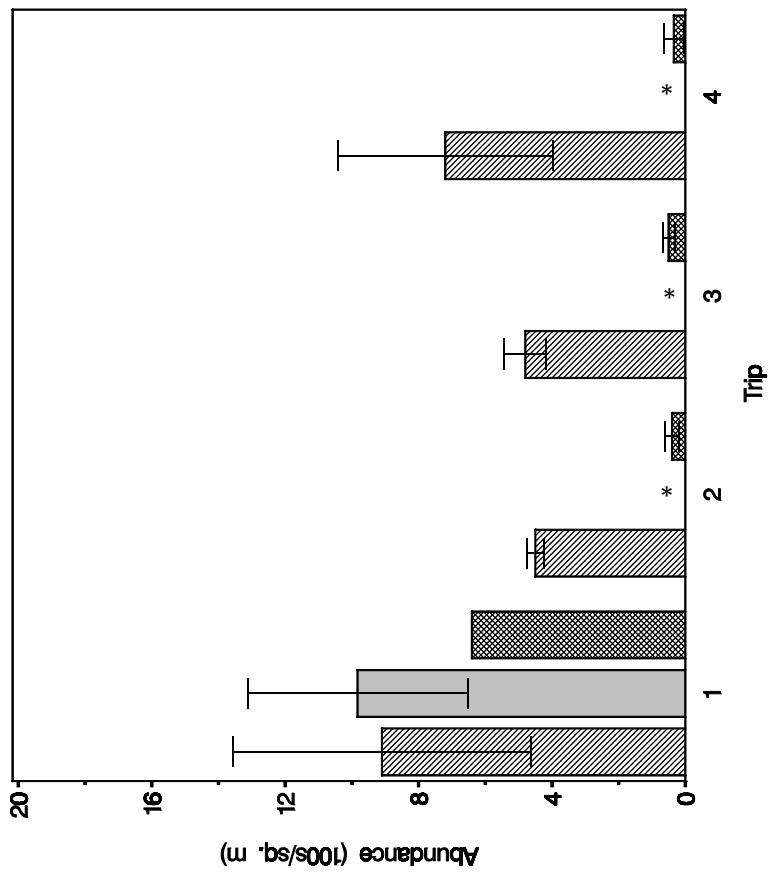


Figure SW-2. Mean and associated standard error of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SW-2. Mean (\bar{x}_r) and associated standard error (SE) of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (I) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (I)	Reference				Undisturbed				Disturbed			
	\bar{x}_r	SE	N	\bar{x}_r	SE	N	\bar{x}_r	SE	N	R_{du}	R_{dr}	R_{ur}
1	910.00	447.62	4	982.86	329.49	7	640.00		1	0.65	0.70	1.08
2	450.00	25.17	4				40.00	20.00	8		0.09	
3	480.00	63.25	4				50.00	18.13	8		0.10	
4	720.00	322.90	4				0	35.00	29.70	8		0.05
Summer	640.00	176.29		982.86			191.25	150.19	0.19	0.30	1.54	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	DONAX ABUNDANCE
HABITAT:	SWASH

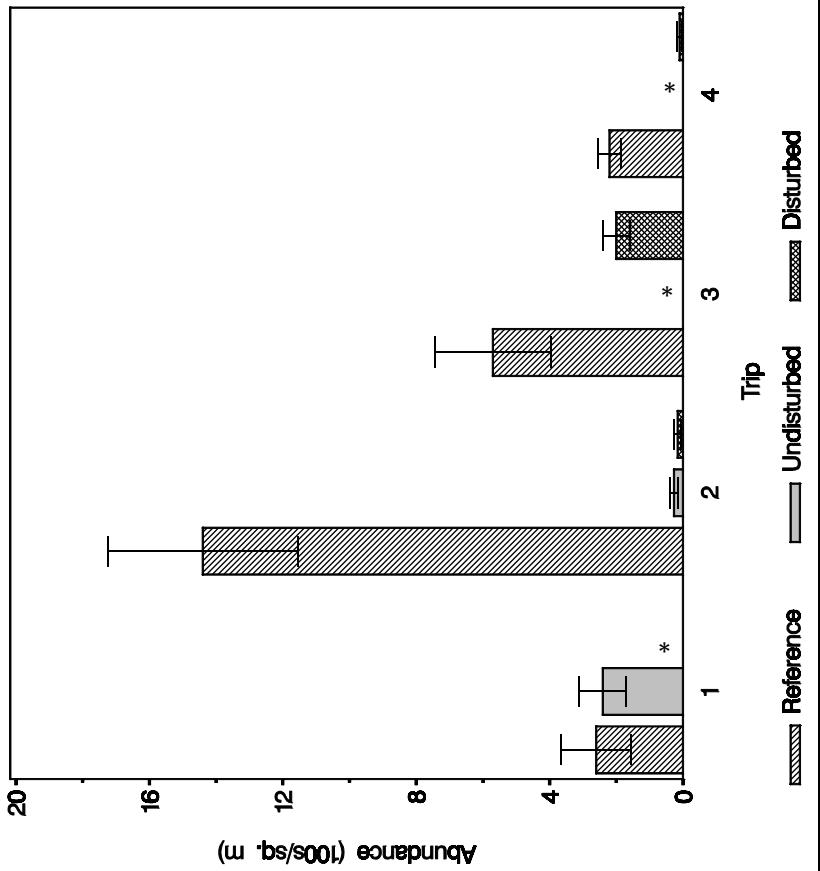


Figure SW-3. Mean and associated standard error of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SW-3. Mean (\bar{x}_i) and associated standard error (SE) of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Oak Island, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	n	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	260.00	105.20	4	240.00	70.10	8			0			0.92
2	1440.00	285.19	4	26.67	13.33	3	16.00	9.80	5	0.60	0.01	0.02
3	570.00	173.88	4			0	200.00	40.00	8		0.35	
4	220.00	34.64	4			0	10.00	6.55	8		0.05	
Fall	622.50	296.84		133.33	81.21		75.33	55.48		0.57	0.12	0.21

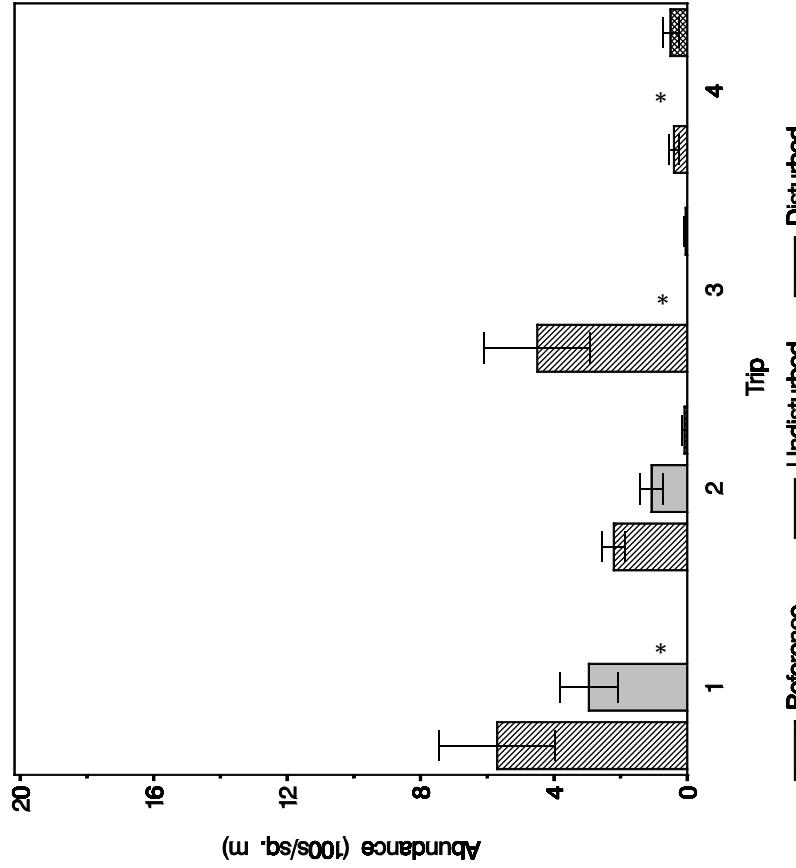


Figure SW 4. Mean and associated standard error of the total *Donax variabilis* abundance within the swash habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Trip (I)	Reference	Undisturbed			Disturbed			R_{dr}	R_{ur}
		\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	570.00	173.88	4	295.00	86.83	8		0	0.52
2	220.00	34.64	4	106.67	35.28	3	8.00	5	0.08
3	450.00	159.48	4		0	5.00	8	0.04	0.48
4	40.00	16.33	4		0	50.00	23.60	8	0.01
Winter	320.00	132.49		200.83	76.74	21.00	14.75	0.10	1.25
								0.07	0.63

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	EMERITA ABUNDANCE
HABITAT:	SWASH

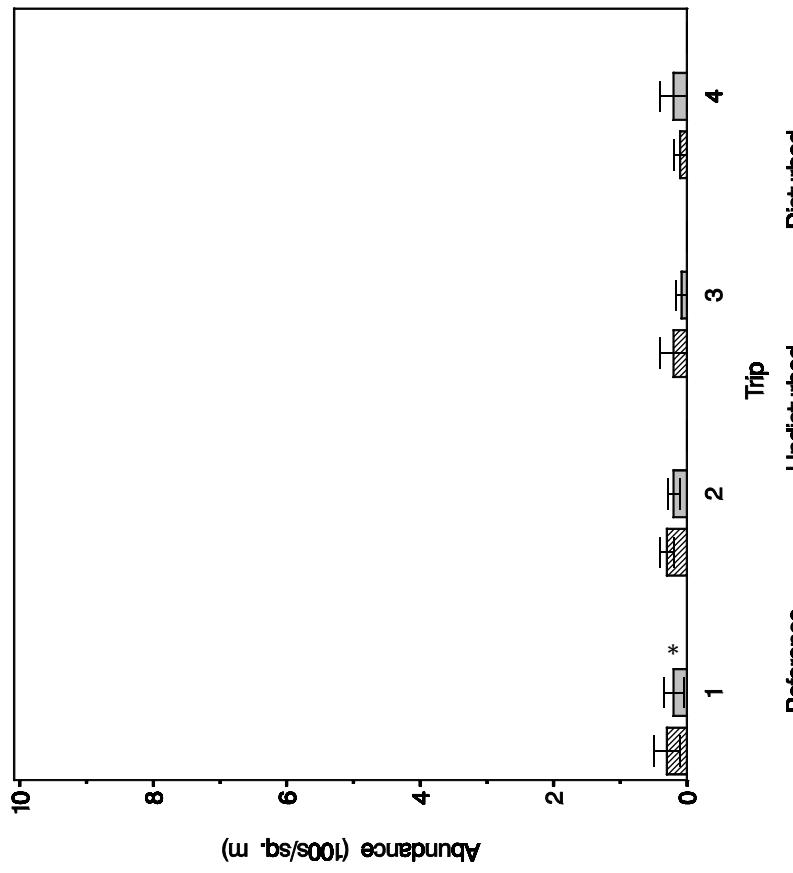


Figure SW-5. Mean and associated standard error of the total *Emerita talpoidea* abundance within the swash habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SW-5. Mean (\bar{x}_i) and associated standard error (SE) of the total *Emerita talpoidea* abundance within the swash habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (I)	Reference			Undisturbed			Disturbed		
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N
1	30.00	19.15	4	20.00	15.12	8		0	
2	30.00	10.00	4	20.00	8.94	6	0.00	2	0.00
3	20.00	20.00	4	8.00	8.00	5	0.00	3	0.00
4	10.00	10.00	4	20.00	20.00	2	0.00	6	0.00
Spring	22.50	9.13		17.00	7.06		0.00	0.00	0.00

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: EMERITA ABUNDANCE
HABITAT: SWASH

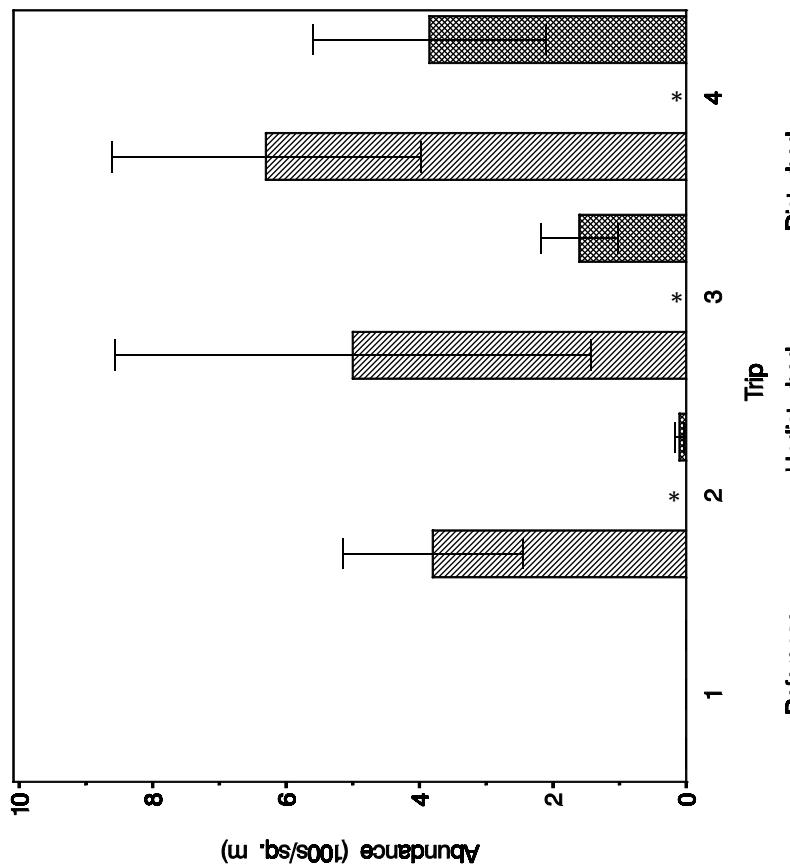


Figure SW-6. Mean and associated standard error of the total *Emerita talpoidea* abundance within the swash habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SW-6. Mean (\bar{x}_i) and associated standard error (SE) of the total *Emerita talpoidea* abundance within the swash habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (I)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.00	0.00	4	0.00	0.00	7	0.00		1			
2	380.00	135.15	4			0	10.00	6.55	8		0.03	
3	500.00	356.84	4			0	160.00	57.57	8		0.32	
4	630.00	231.73	4			0	385.00	175.00	8		0.61	
Summer	377.50	175.77		0.00			138.75	108.17		0.37	0.00	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	EMERITA ABUNDANCE
HABITAT:	SWASH

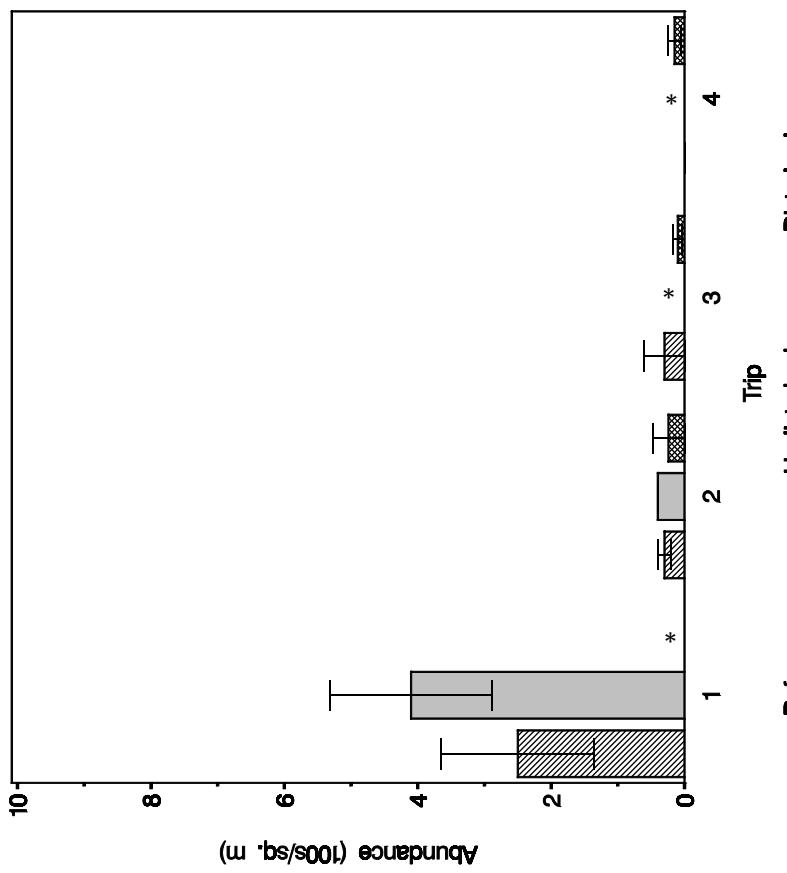


Figure SW-7. Mean and associated standard error of the total *Emerita talpoida* abundance within the swash habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SW-7. Mean (\bar{x}_i) and associated standard error (SE) of the total *Emerita talpoida* abundance within the swash habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (I) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}) (R_{ur}) and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (I)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	250.00	114.75	4	410.00	122.07	8			0			1.64
2	30.00	10.00	4	40.00	0.00	3	24.00	24.00	5	0.60	0.80	1.33
3	30.00	30.00	4			0	10.00	6.55	8		0.33	
4	0.00	0.00	4			0	15.00	10.52	8			
Fall	77.50	65.13		225.00	140.79		16.33	7.84	0.07	0.21		2.90

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	EMERITA ABUNDANCE
HABITAT:	SWASH

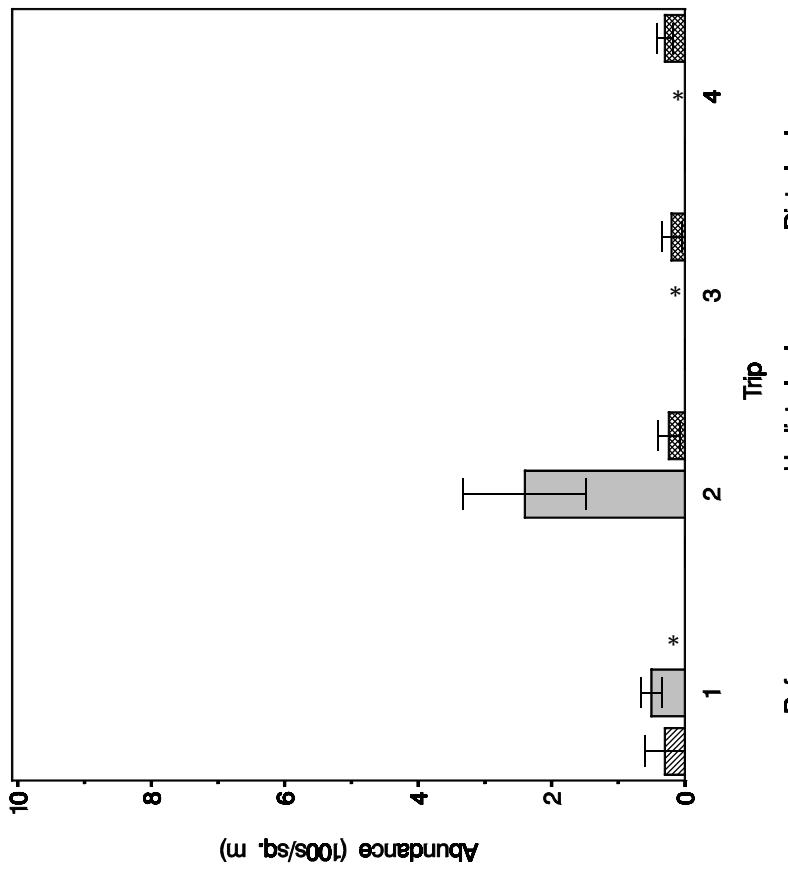


Figure SW-8. Mean and associated standard error of the total *Emerita talpoida* abundance within the swash habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SW-8. Mean (\bar{x}_i) and associated standard error (SE) of the total *Emerita talpoida* abundance within the swash habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (I)	Reference			Undisturbed			Disturbed		
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N
1	30.00	30.00	4	50.00	16.48	8			0
2	0.00	0.00	4	240.00	92.38	3	24.00	16.00	5
3	0.00	0.00	4			0	20.00	15.12	8
4	0.00	0.00	4			0	30.00	12.54	8
Winter	7.50	10.61		145.00	71.72		24.67	7.64	0.17
									3.29
									19.33
									1.67

Table SW-9. *Donax variabilis* and *Emerita talpoida* abundance interval estimates (90% confidence level) for differences between categories in the swash habitat. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0. Shaded intervals are statistically significant.

Parameter	Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
		CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
<i>Donax variabilis</i>	Spring	-242.03	146.53	11.21	338.79	118.27	327.23
<i>Emerita talpoida</i>		-13.54	24.54	7.44	37.56	5.35	28.65
<i>Donax variabilis</i>	Summer			66.62	830.88		
<i>Emerita talpoida</i>				-101.79	579.29		
<i>Donax variabilis</i>	Fall	-18.61	996.95	48.90	1045.43	-104.28	220.28
<i>Emerita talpoida</i>		-403.45	108.45	-47.07	169.40	-24.00	441.33
<i>Donax variabilis</i>	Winter	-133.47	371.80	79.04	518.96	50.89	308.77
<i>Emerita talpoida</i>		-257.12	-17.88	-38.73	4.40	1.33	239.34
<i>Donax variabilis</i>	All	-284.31	393.18	24.88	710.08	132.59	493.50
<i>Emerita talpoida</i>		-191.72	240.72	-102.84	255.46	-123.54	227.16

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

SHALLOW HABITAT

Table SH-1. Shallow species list and total percent composition

Family	Scientific Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
Cnidaria:Anthozoa	<i>Renilla reniformis</i>	0.65	0.86	2.54	0.89	0.45	0.63	0.14	0.62				
Platyhelminthes:Turbellaria	Turbellaria	0.6	0.9	3.88	2.1			1.11					
Nemertea	Nemertea	0.05											2.48
Annelida:Polychaeta	<i>Carazzella hobsonae</i>	0.05	2.53	0.04									
	<i>Eteone heteropoda</i>	0.05											
	Glyceridae												
	<i>Leitoscoloplos</i> spp.												
	Lumbrineridae												
	<i>Magelona papillicornis</i>												
	<i>Mediomastus ambiseta</i>												
	<i>Microphthalmaus abernans</i>												
	<i>Nephtys buccera</i>												
	Nereididae												
	Orbiniidae												
	<i>Paraonis fulgens</i>												
	<i>Polydora</i> spp.												
	<i>Polygordius</i> spp.												
	<i>Sabellaria vulgaris</i>	0.15	0.3	76.15	17.16	0.75	0.22	0.32	0.62				
	<i>Scolelepis squamata</i>	71.43		0.07				21.27	3.76	13.04			
	<i>Scoletoma impatiens</i>												
	Spionidae												
	<i>Spiophanes bombyx</i>	0.4	0.05	0.04	0.35	0.08							
	Oligochaeta	0.05	0.04	0.04									
	Hirudinea												
	Gastropoda	0.05											
	<i>Anadara</i> spp.												
	<i>Crassinella</i> spp.	0.3	0.13	0.14	0.08	0.45	0.08	2.09					
	<i>Donax variabilis</i>	2.89	0.56	34.6	69.47	16.07	0.08	15.86					
	<i>Mercenaria mercenaria</i>		0.04	0.04									
	Mytilidae		0.04	0.09									
	<i>Mytilus edulis</i>	0.15	0.09										
	<i>Spisula solidissima</i>												
	<i>Tellina</i> spp.	0.25											
	<i>Balanus</i> spp.												
	<i>Balanus balanoides</i>	0.05	0.09	16.74	1.73	9.82	5.4	1.53	0.62				
	<i>Americamysis</i> spp.	0.6	0.09										
	<i>Bowmaniella</i> spp.												

Table SH-1. (Continued)

Family	Scientific Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference						
Arthropoda:Cumacea	<i>Campylaspis affinis</i>	0.9	0.13	0.07	0.07	0.89							
	<i>Cyclaspis varians</i>					0.21							
	<i>Mancocuma stellifera</i>					0.89							
	<i>Oxyurostylis smithi</i>					0.08							
	<i>Ancinus depressus</i>					0.08							
	<i>Chiridotea coeca</i>					0.22							
	<i>Chiridotea turttili</i>					0.89							
	<i>Paracerceis caudata</i>					0.95							
	<i>Acanthohaustorius millsi</i>	1.29	0.17	0.07	0.68	0.95	5.42					3.73	
	<i>Acanthohaustorius similis</i>	1.79	0.34	0.28	0.08	0.95	0.7					0.62	
	<i>Americhelidium americanum</i>					0.95							
	<i>Ameroculodes species complex</i>					0.14							
	<i>Ampelisca abdita</i>					0.14							
	<i>Amphiporeia virginiana</i>					0.14							
	<i>Atylus cf. minikoi</i>					0.14							
	<i>Bathyporeia parkeri</i>					0.14							
	<i>Casco bigelowi</i>					0.14							
	<i>Cerapus tubularis</i>					0.14							
	<i>Haustorius canadensis</i>					0.14							
	<i>Hemiaegina minuta</i>					0.14							
	<i>Microprotopus raneyi</i>					0.14							
	<i>Parahaustorius longimerus</i>					0.14							
	<i>Protohaustorius cf. deichmannae</i>					0.14							
	<i>Rhepoxynius epistomus</i>					0.14							
	<i>Emerita talpoida</i>					0.14							
	<i>Ogyrides alphaerostris</i>					0.14							
	<i>Pagurus longicarpus</i>					0.14							
	<i>Pinnotheridae</i>					0.14							
	<i>Mellita quinquesperforata</i>					0.14							
	Total	100	100	100	100	100	100	100	100	100	100	100	

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Total Abundance
HABITAT:	Shallow

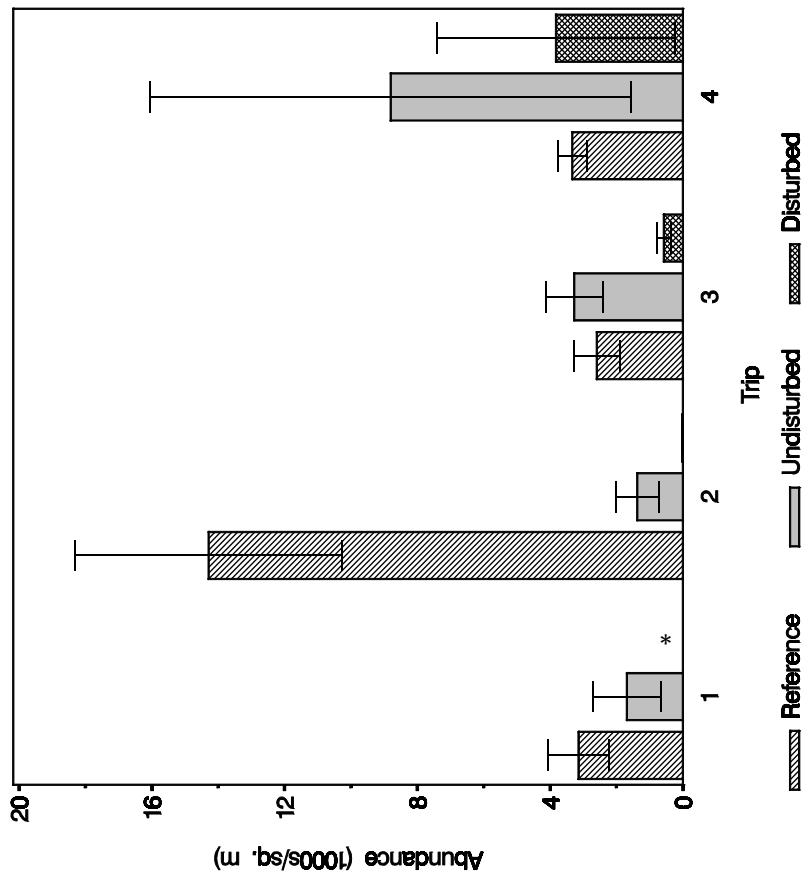


Figure SH-1. Mean and associated standard error of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-2. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	3140.00	911.92	4	1685.00	1024.87	8			0			0.54
2	14290.00	4021.65	4	1373.33	658.21	6	20.00	20.00	2	0.01	0.00	0.10
3	2590.00	685.54	4	3272.00	861.57	5	573.33	213.33	3	0.18	0.22	1.26
4	3330.00	430.00	4	8800.00	7240.00	2	3820.00	3596.75	6	0.43	1.15	2.64
Spring	5837.50	3011.09		3782.58	2095.99		1471.11	1679.53		0.39	0.25	0.65

SITE:	CASWELL BEACH
SEASON:	SUMMER
PARAMETER:	TOTAL ABUNDANCE
HABITAT:	SHALLOW

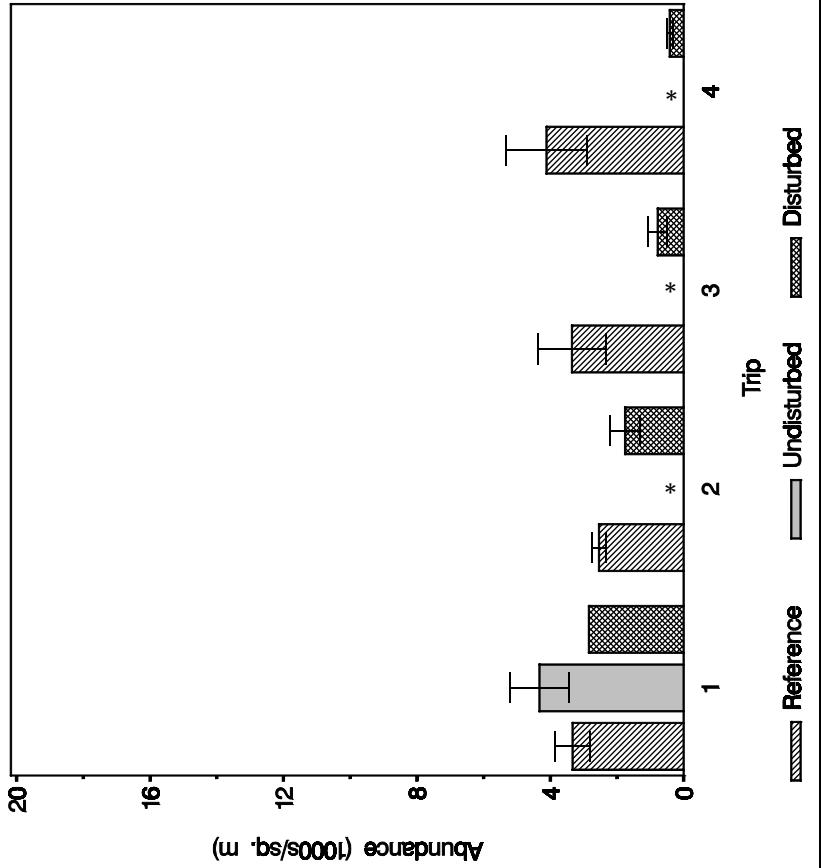


Figure SH-2. Mean and associated standard error of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-3. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	3330.00	525.71	4	4320.00	878.83	7	2840.00	1	0.66	0.85	1.30	
2	2540.00	199.67	4				1755.00	445.96	8		0.69	
3	3350.00	1010.00	4				775.00	287.74	8		0.23	
4	4110.00	1218.35	4				415.00	94.70	8		0.10	
Summer	3332.50	528.24		4320.00			1446.25	571.84	0.33	0.43	1.30	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	TOTAL ABUNDANCE
HABITAT:	SHALLOW

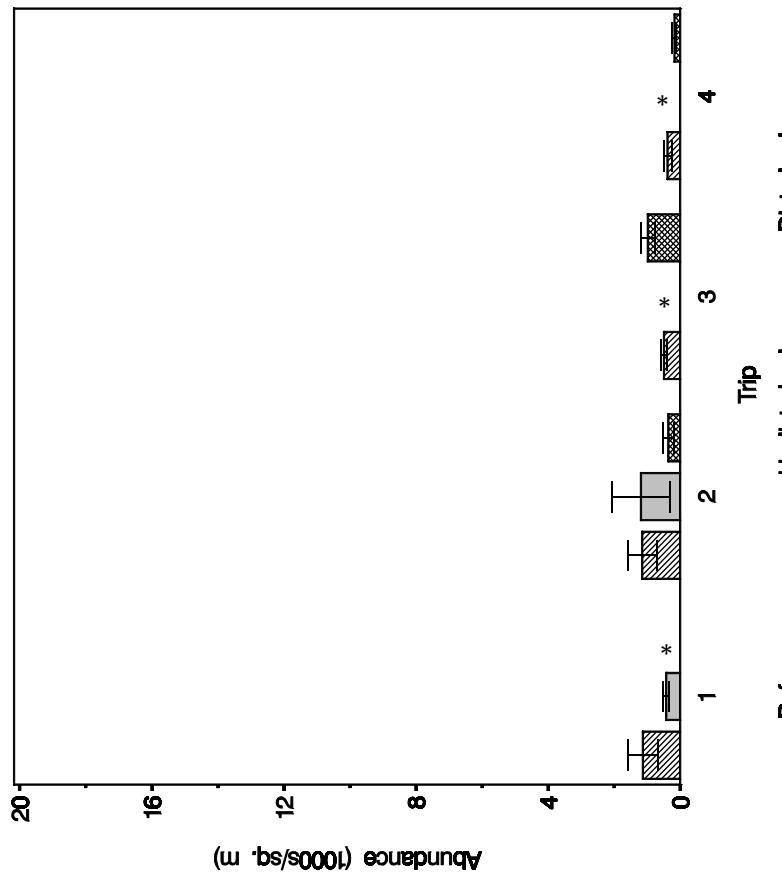


Figure SH-3. Mean and associated standard error of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-4. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	1130.00	463.72	4	420.00	96.81	8			0		0.37
2	1150.00	438.29	4	1186.67	888.54	3	360.00	161.99	5	0.30	0.31
3	490.00	82.26	4			0	980.00	211.12	8		2.00
4	380.00	127.02	4			0	170.00	59.88	8		0.45
Fall	787.50	262.33		803.33	359.17		503.33	225.85		0.63	0.64
											1.02

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: TOTAL ABUNDANCE
HABITAT: SHALLOW

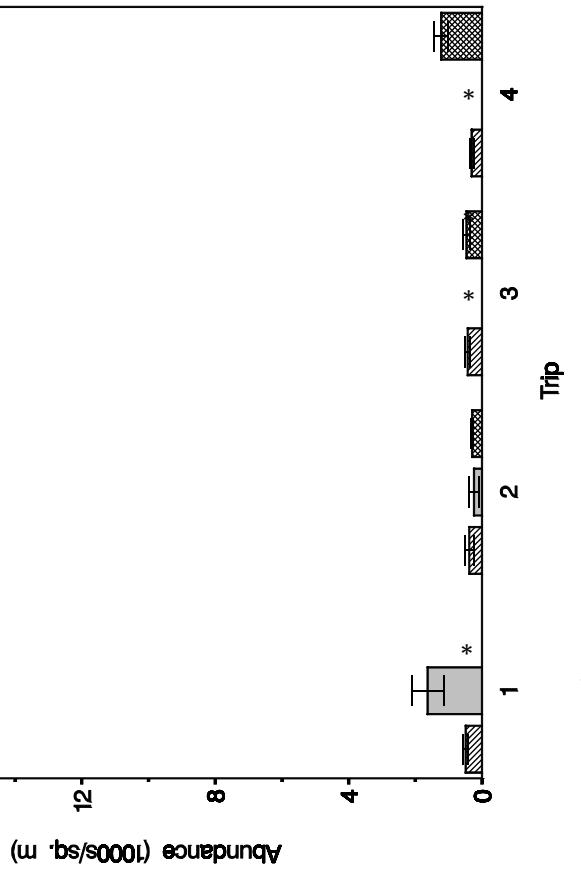


Figure SH-4. Mean and associated standard error of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-5. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed		
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N
1	490.00	82.26	4	1630.00	474.60	8		0	
2	380.00	127.02	4	240.00	140.48	3	296.00	37.09	5
3	430.00	71.88	4		0		95.30	8	
4	310.00	61.91	4		0		216.72	8	
Winter	402.50	58.74		935.00	532.74		662.00	258.14	0.71
								1.64	
									2.32

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: TOTAL BIOMASS
HABITAT: SHALLOW

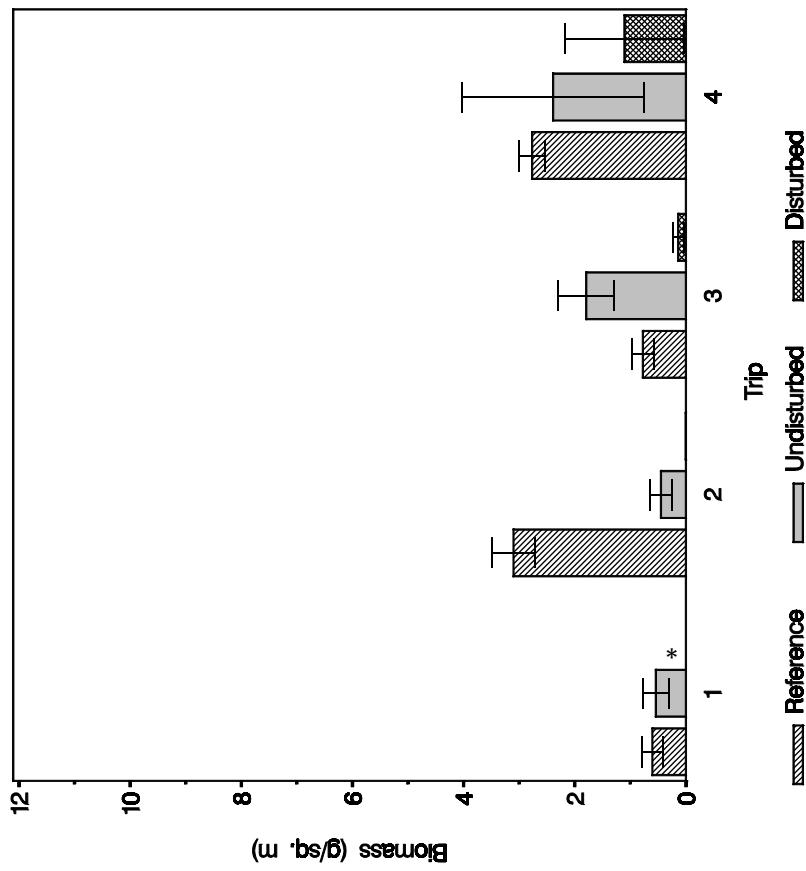


Figure SH-5. Mean and associated standard error of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-6. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	0.60	0.19	4	0.54	0.24	8			0			0.90
2	3.10	0.38	4	0.45	0.19	6	0.00	0.00	2	0.00	0.00	0.15
3	0.78	0.19	4	1.79	0.51	5	0.14	0.10	3	0.08	0.18	2.31
4	2.77	0.24	4	2.39	1.63	2	1.10	1.07	6	0.46	0.40	0.86
Spring	1.81	0.67		1.29	0.56		0.41	0.50		0.32	0.23	0.71

SITE:	CASWELL BEACH
SEASON:	SUMMER
PARAMETER:	TOTAL BIOMASS
HABITAT:	SHALLOW

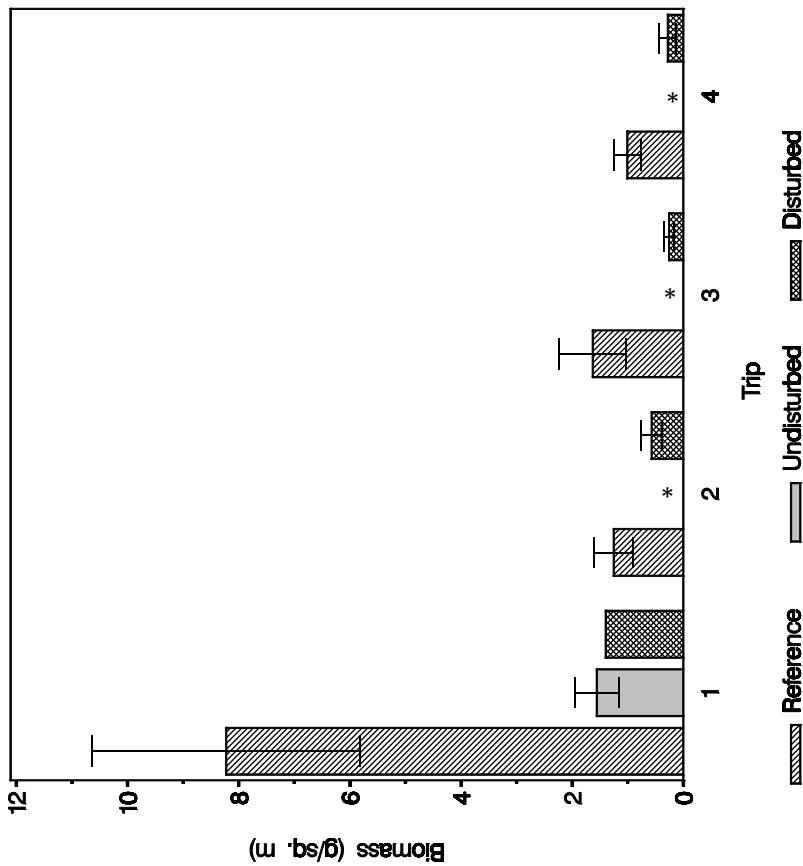


Figure SH-6. Mean and associated standard error of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-7. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	8.23	2.41	4	1.56	0.39	7	1.40		1	0.90	0.17	0.19
2	1.25	0.35	4				0.57	0.18	8		0.46	
3	1.63	0.60	4				0.26	0.09	8		0.16	
4	1.01	0.25	4				0.28	0.15	8		0.28	
Summer	3.03	1.85		1.56			0.63	0.28		0.40	0.21	0.51

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: TOTAL BIOMASS
HABITAT: SHALLOW

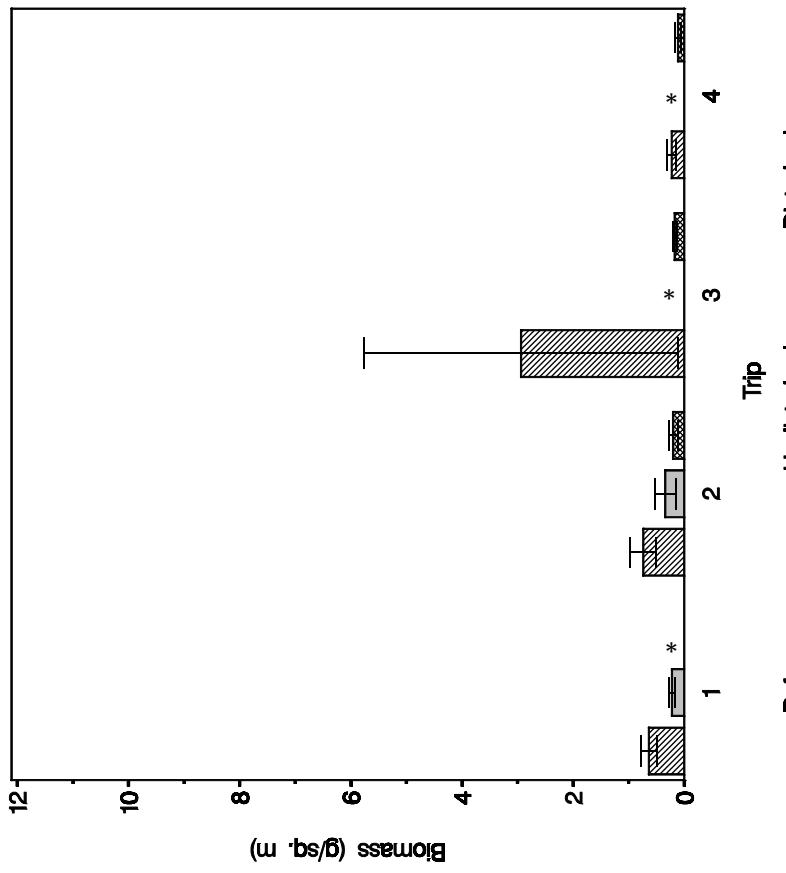


Figure SH-7. Mean and associated standard error of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-8. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.64	0.15	4	0.22	0.05	8			0			0.35
2	0.74	0.24	4	0.34	0.19	3	0.20	0.08	5	0.59	0.27	0.46
3	2.94	2.82	4			0	0.17	0.04	8		0.06	
4	0.23	0.09	4			0	0.11	0.05	8		0.50	
Fall	1.13	0.94		0.28	0.07		0.16	0.04		0.58	0.14	0.25

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	TOTAL BIOMASS
HABITAT:	SHALLOW

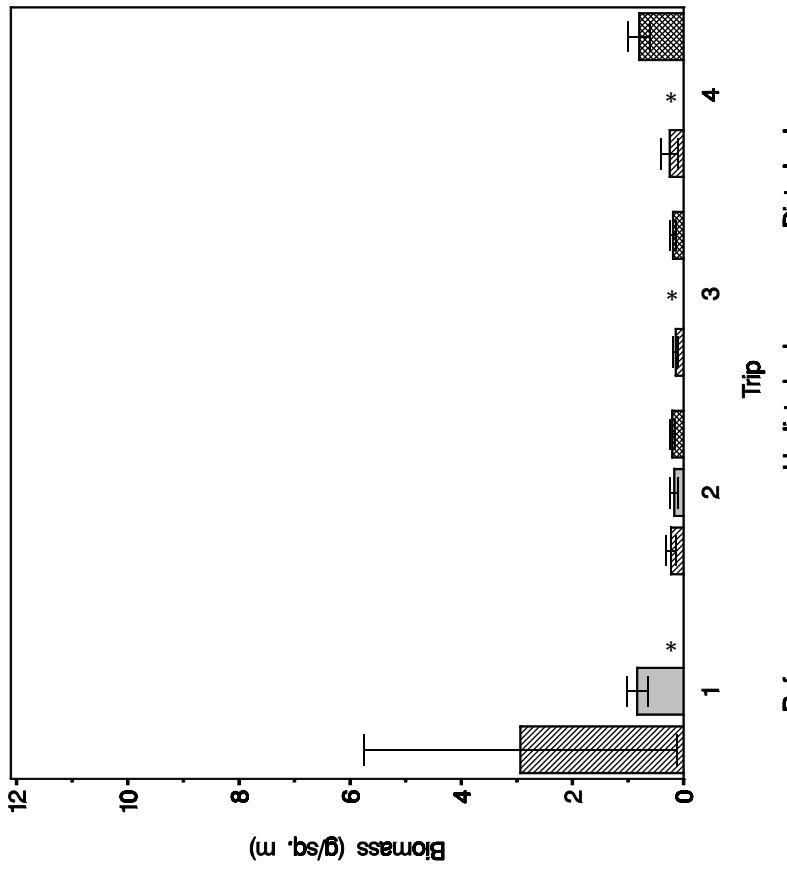


Figure SH-8. Mean and associated standard error of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-9. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	2.94	2.82	4	0.83	0.18	8			0			0.28
2	0.23	0.09	4	0.17	0.07	3	0.20	0.05	5	1.22	0.90	0.74
3	0.14	0.05	4			0	0.19	0.05	8		1.35	
4	0.25	0.15	4			0	0.80	0.20	8		3.19	
Winter	0.89	0.98		0.50	0.25		0.40	0.19		0.79	0.45	0.56

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: DIVERSITY
HABITAT: SHALLOW

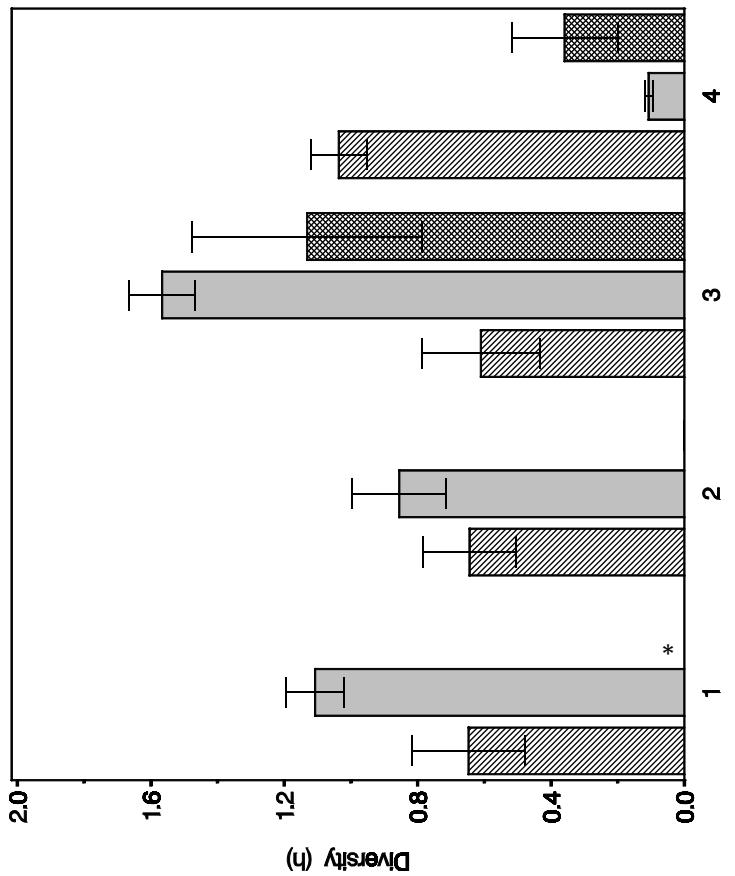


Figure SH-9. Mean and associated standard error of the macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-10. Mean (\bar{x}_i) and associated standard error (SE) of the macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.65	0.17	4	1.11	0.09	8			0			1.71
2	0.64	0.14	4	0.85	0.14	6	0.00	0.00	2	0.00	0.00	1.33
3	0.61	0.18	4	1.57	0.10	5	1.13	0.35	3	0.72	1.85	2.57
4	1.04	0.08	4	0.11	0.01	2	0.36	0.16	6	3.35	0.35	0.10
Spring	0.73	0.12		0.91	0.31		0.50	0.31		0.55	0.68	1.24

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: DIVERSITY
HABITAT: SHALLOW

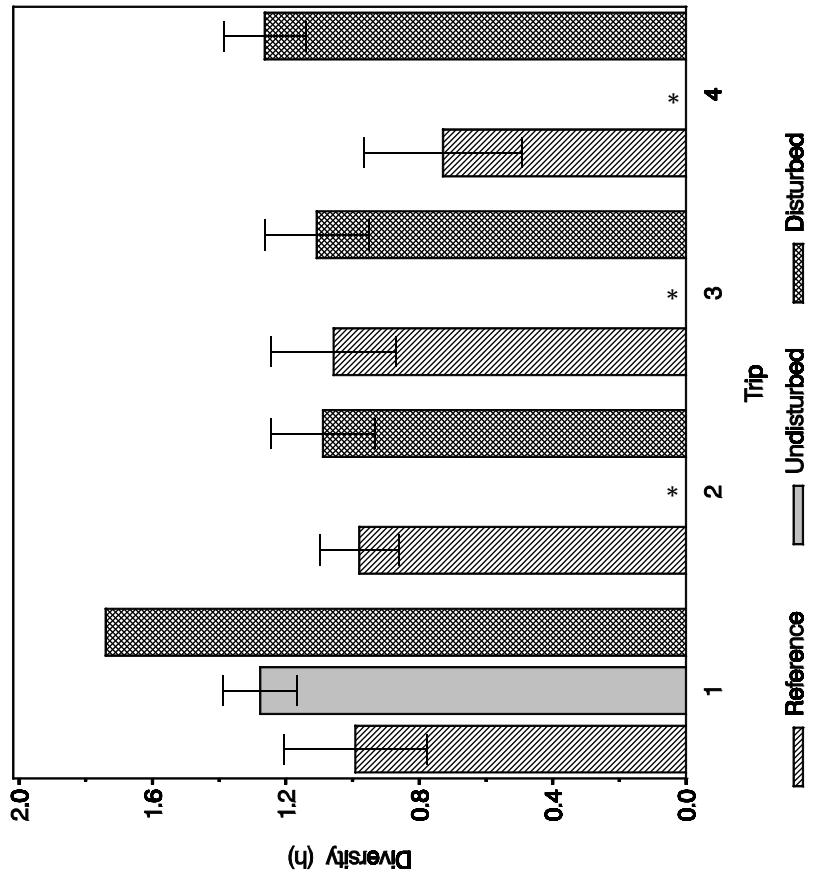


Figure SH-10. Mean and associated standard error of the macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-11. Mean (\bar{x}_i) and associated standard error (SE) of the macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_r	SE	N	\bar{x}_u	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.99	0.21	4	1.28	0.11	7	1.74		1	1.36	1.75	1.29
2	0.98	0.12	4				0	1.09	0.15	8		1.11
3	1.06	0.19	4				0	1.11	0.15	8		1.05
4	0.73	0.24	4				0	1.26	0.12	8		1.73
Summer	0.94	0.12		1.28			1.30	0.17	1.02	1.38	1.02	1.36

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: DIVERSITY
HABITAT: SHALLOW

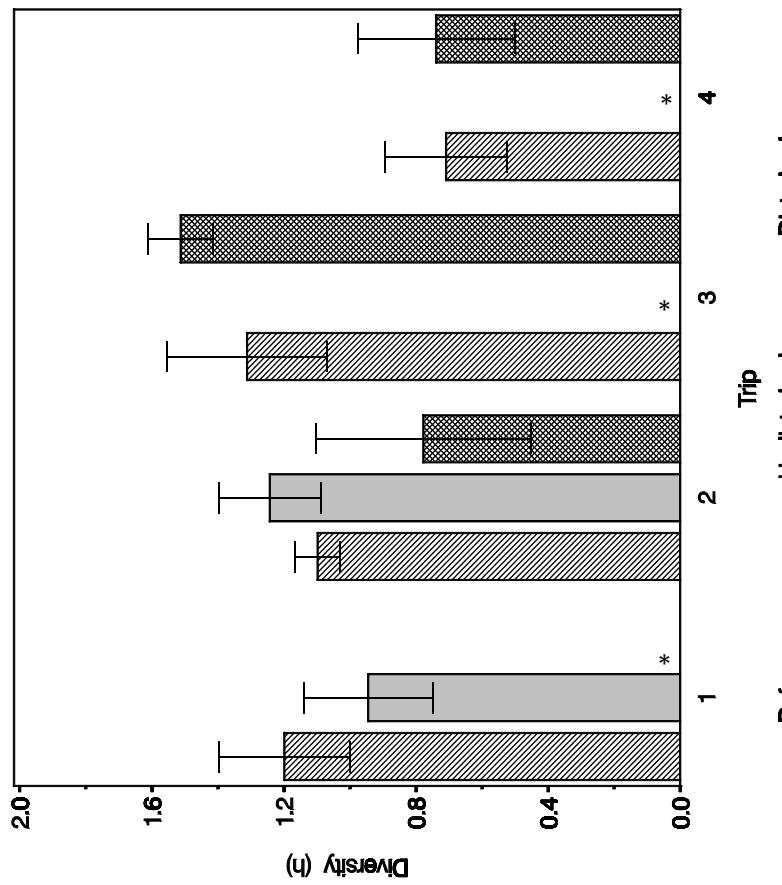


Figure SH-11. Mean and associated standard error of the macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-12. Mean (\bar{x}_i) and associated standard error (SE) of the macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	1.20	0.20	4	0.94	0.19	8			0			0.79
2	1.10	0.07	4	1.24	0.15	3	0.78	0.32	5	0.63	0.71	1.13
3	1.31	0.24	4			0	1.51	0.10	8		1.15	
4	0.71	0.19	4			0	0.74	0.24	8		1.04	
Fall	1.08	0.16		1.09	0.14		1.01	0.25		0.92	0.94	1.01

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: DIVERSITY
HABITAT: SHALLOW

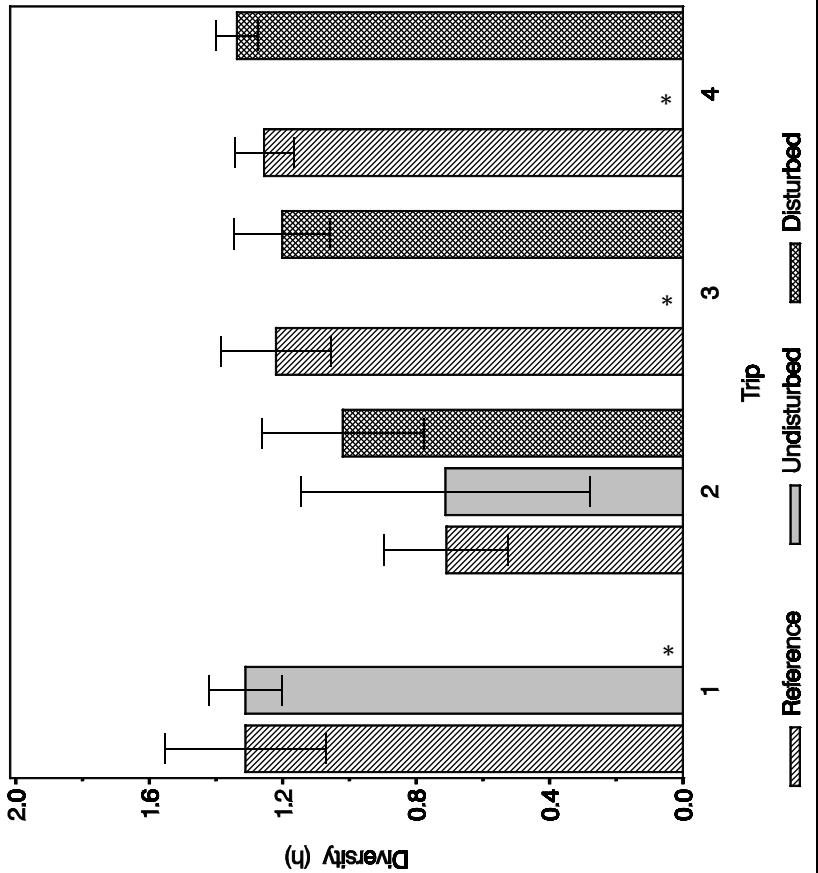


Figure SH-12. Mean and associated standard error of the total macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-13. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic diversity within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	1.31	0.24	4	1.31	0.11	8			0			1.00
2	0.71	0.19	4	0.71	0.43	3	1.02	0.24	5	1.43	1.44	1.00
3	1.22	0.16	4		0	1.20	0.14	8		0.99		
4	1.26	0.09	4		0	1.34	0.06	8		1.07		
Winter	1.12	0.17		1.01	0.25		1.19	0.11	1.17	1.06	1.07	0.90

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: SHALLOW

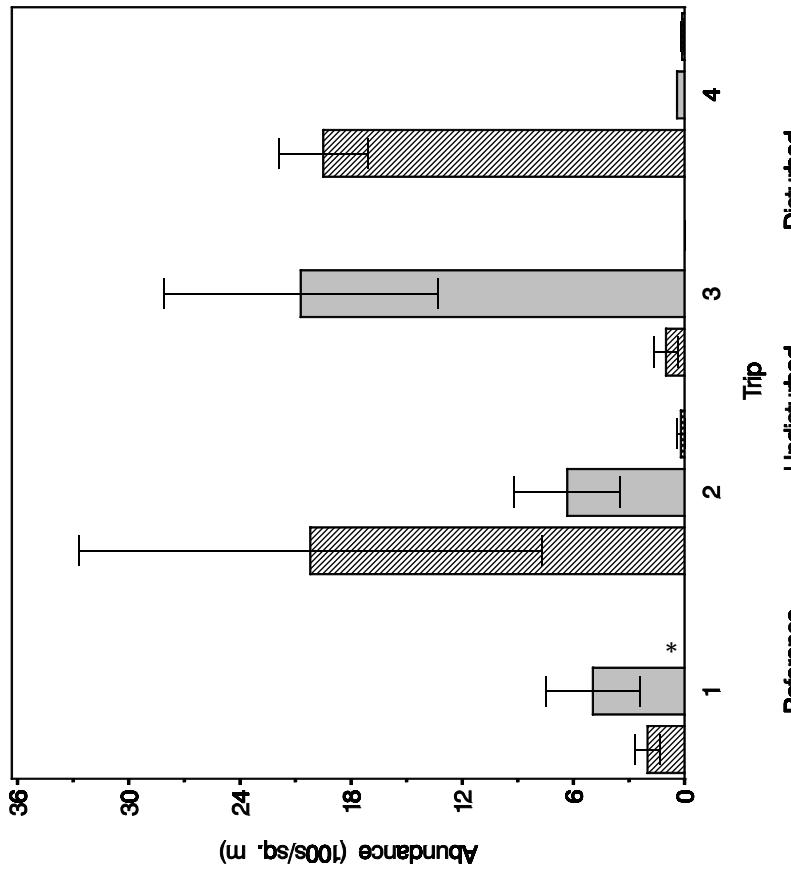


Figure SH-13. Mean and associated standard error of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-14. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	200.00	69.28	4	495.00	254.21	8			0			2.48
2	2020.00	1248.52	4	633.33	285.73	6	20.00	20.00	2	0.03	0.01	0.31
3	100.00	62.18	4	2072.00	739.66	5	0.00	0.00	3	0.00	0.00	20.72
4	1950.00	240.21	4	40.00	0.00	2	13.33	8.43	6	0.33	0.01	0.02
Spring	1067.50	618.70		810.08	487.39		11.11	7.34	0.01	0.01	0.01	0.76

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: SHALLOW

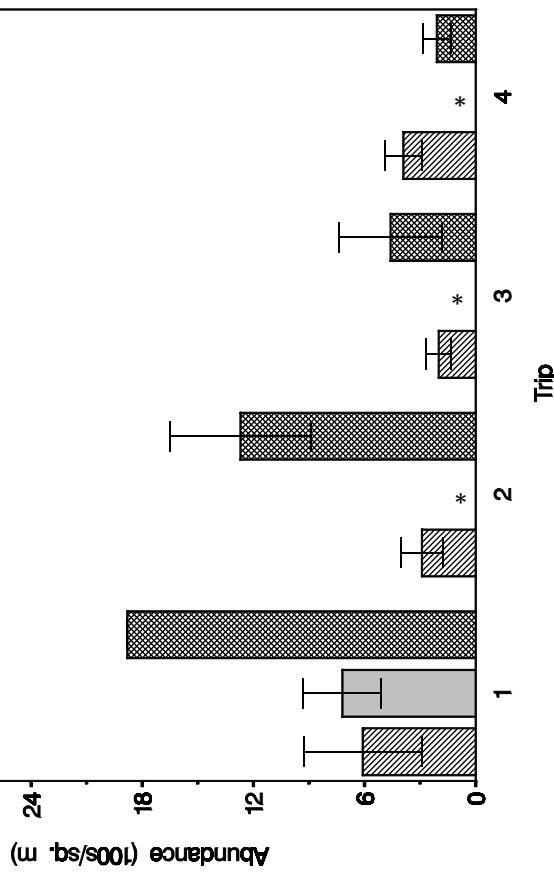


Figure SH-14. Mean and associated standard error of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-15. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	610.00	317.23	4	720.00	210.94	7	1880.00		1	2.61	3.08	1.18
2	290.00	114.75	4				0	1270.00	378.63	8		4.38
3	200.00	67.33	4				0	460.00	280.00	8		2.30
4	390.00	97.13	4				0	210.00	76.63	8		0.54
Summer	372.50	125.53		720.00			955.00	412.94	1.33	2.56	1.93	

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: SHALLOW

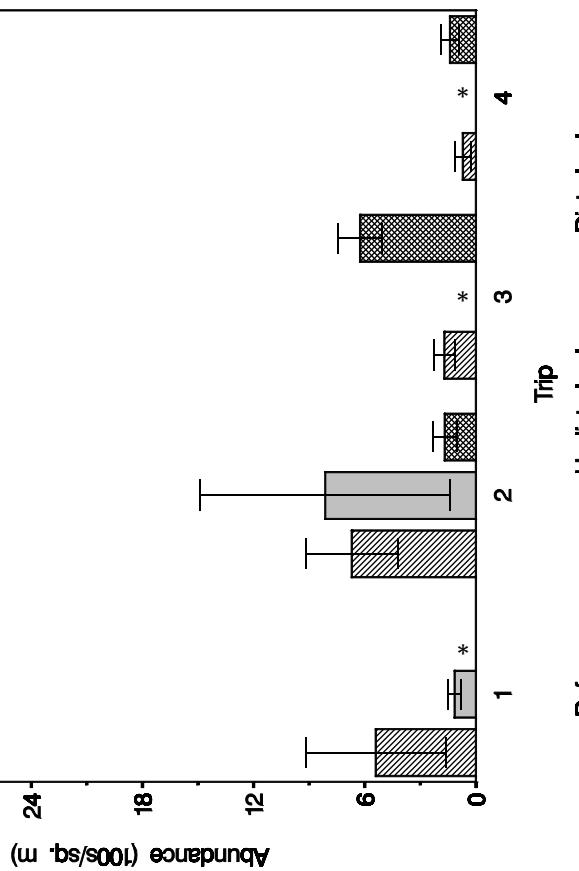


Figure SH-15. Mean and associated standard error of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-16. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	540.00	376.12	4	115.00	35.00	8			0			0.21
2	670.00	248.39	4	813.33	674.22	3	168.00	63.75	5	0.21	0.25	1.21
3	170.00	57.45	4			0	625.00	116.85	8		3.68	
4	70.00	44.35	4			0	140.00	47.81	8		2.00	
Fall	362.50	183.71		464.17	303.60		311.00	142.46	0.67	0.86	1.28	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	CRUSTACEAN ABUNDANCE
HABITAT:	SHALLOW

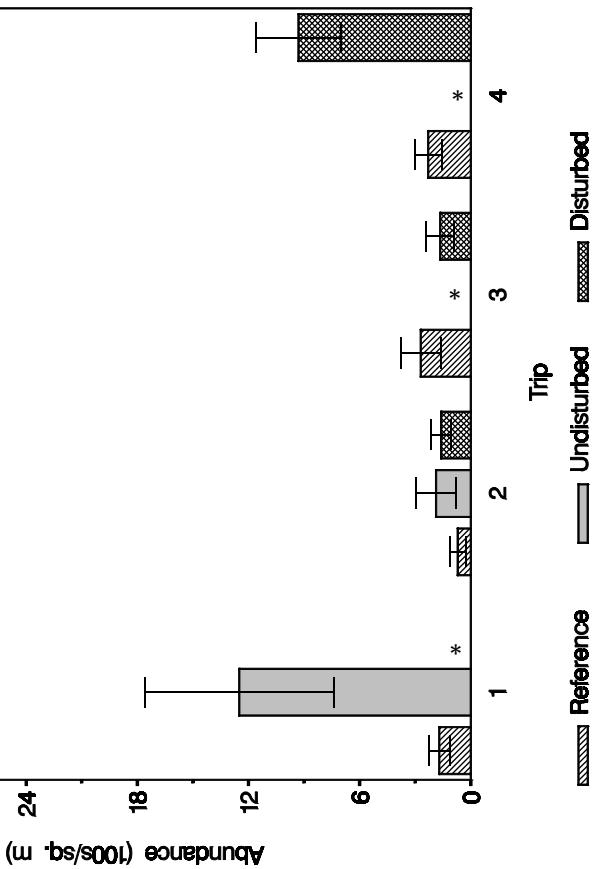


Figure SH-16. Mean and associated standard error of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-17. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	170.00	57.45	4	1250.00	511.06	8			0			7.35
2	70.00	44.35	4	186.67	106.67	3	160.00	52.15	5	0.86	2.29	2.67
3	270.00	108.78	4			0	165.00	76.88	8		0.61	
4	230.00	71.88	4			0	930.00	227.88	8		4.04	
Winter	185.00	57.30		718.33	435.43		418.33	234.01		0.58	2.26	3.88

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Crustacean Biomass
HABITAT:	Shallow

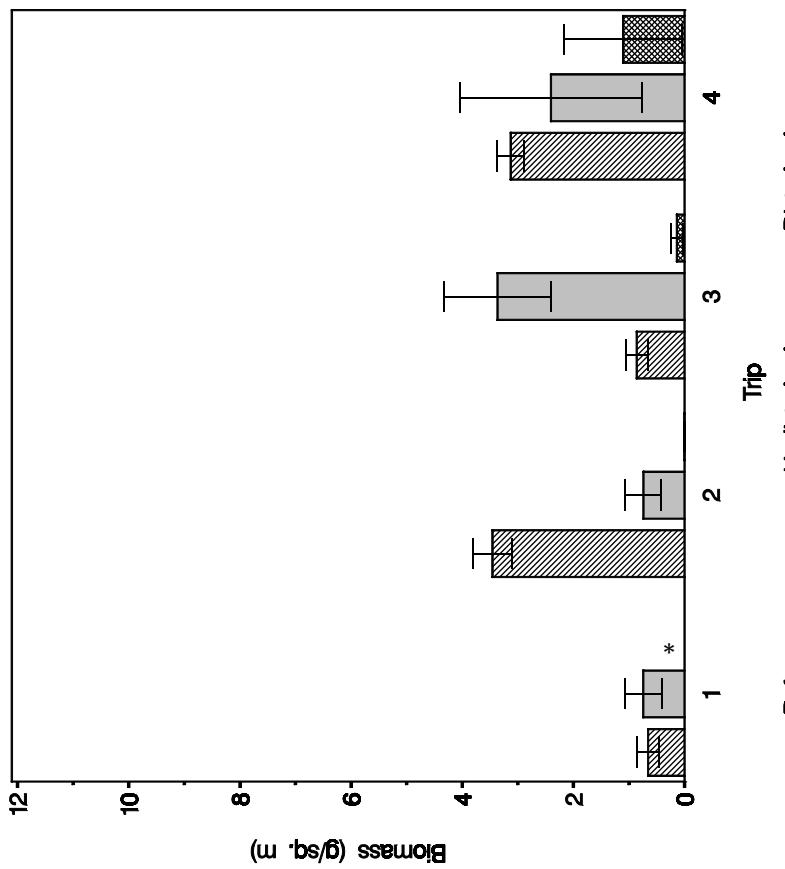


Figure SH-17. Mean and associated standard error of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-18. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.65	0.20	4	0.74	0.33	8			0			1.14
2	3.46	0.35	4	0.74	0.32	6	0.00	0.00	2	0.01	0.00	0.21
3	0.86	0.20	4	3.36	0.97	5	0.14	0.10	3	0.04	0.16	3.91
4	3.13	0.25	4	2.40	1.64	2	1.10	1.07	6	0.46	0.35	0.77
Spring	2.02	0.75		1.81	0.75		0.42	0.50	0.23	0.21	0.90	

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: CRUSTACEAN BIOMASS
HABITAT: SHALLOW

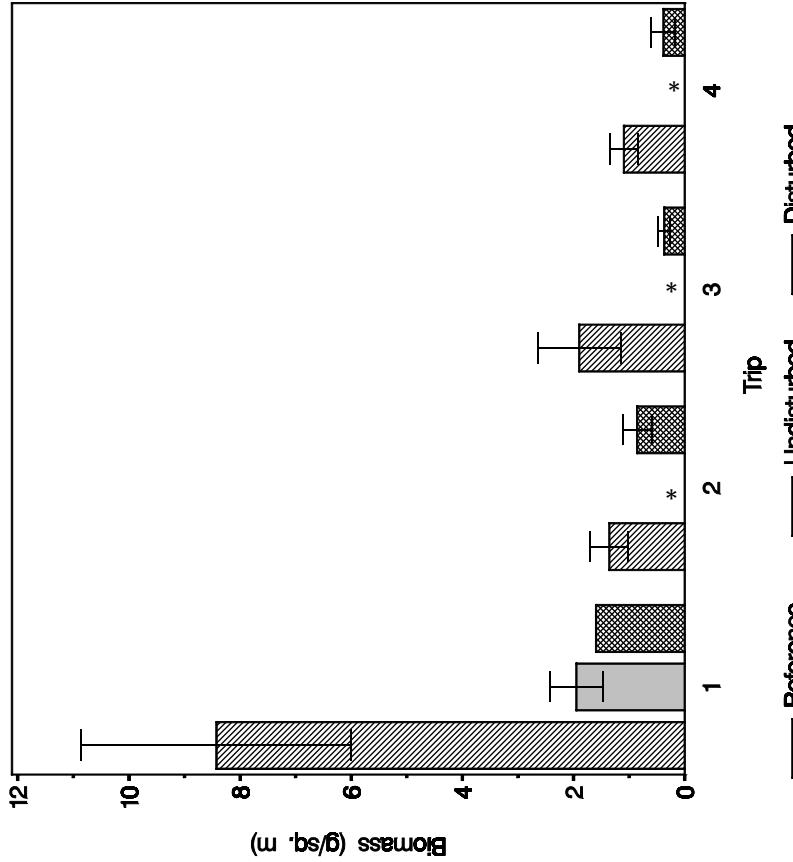


Figure SH-18. Mean and associated standard error of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-19. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	8.43	2.43	4	1.95	0.48	7	1.60		1	0.82	0.19	0.23
2	1.36	0.34	4				0	0.86	8	0.26	8	0.63
3	1.90	0.75	4				0	0.37	8	0.11	8	0.19
4	1.10	0.25	4				0	0.38	8	0.22	8	0.35
Summer	3.19	1.87	4	1.95			0.80	0.31	8	0.41	0.25	0.61

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	CRUSTACEAN BIOMASS
HABITAT:	SHALLOW

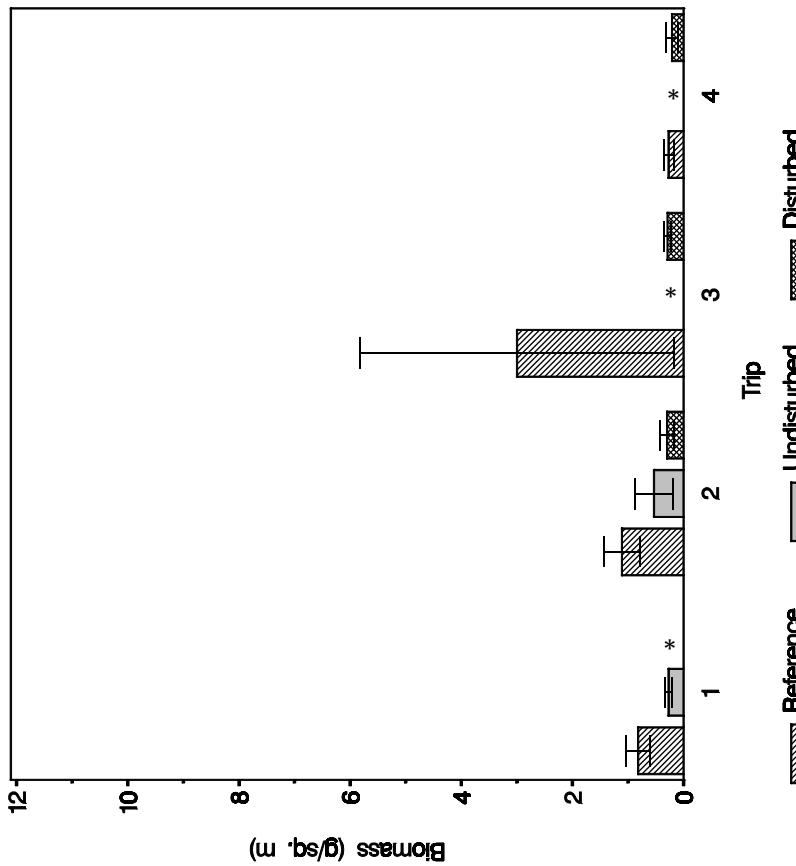


Figure SH-19. Mean and associated standard error of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-20. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.82	0.22	4	0.27	0.06	8			0			0.33
2	1.11	0.32	4	0.53	0.34	3	0.30	0.13	5	0.56	0.27	0.48
3	3.00	2.83	4			0	0.29	0.06	8		0.10	
4	0.27	0.09	4			0	0.21	0.11	8		0.78	
Fall	1.30	0.93		0.40	0.13		0.26	0.05		0.66	0.20	0.31

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	CRUSTACEAN BIOMASS
HABITAT:	SHALLOW

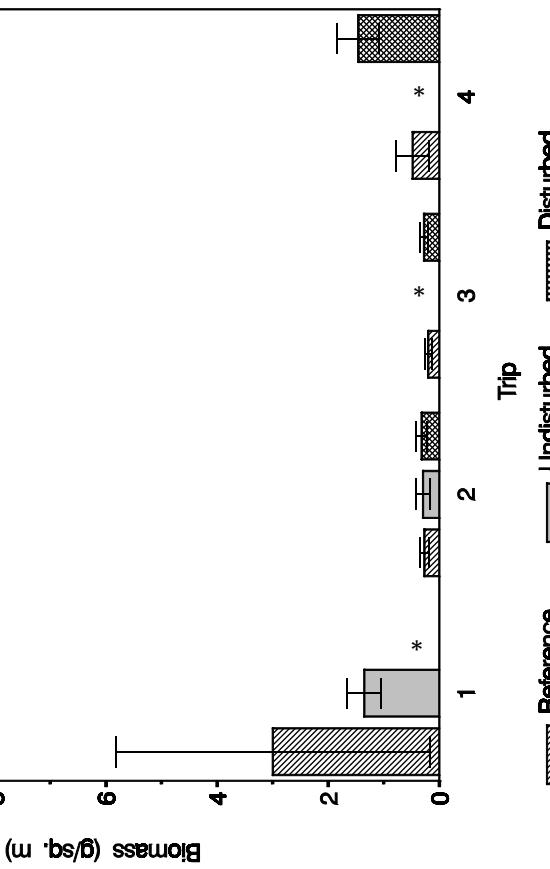


Figure SH-20. Mean and associated standard error of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-21. Mean (\bar{x}_r) and associated standard error (SE) of the total crustacean biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_r	SE	N	\bar{x}_r	SE	N	\bar{x}_r	SE	N	R_{du}	R_{dr}	R_{ur}
1	3.00	2.83	4	1.35	0.31	8			0			0.45
2	0.27	0.09	4	0.29	0.14	3	0.32	0.10	5	1.08	1.19	1.10
3	0.20	0.06	4		0	0.28	0.07	8			1.39	
4	0.48	0.30	4		0	1.46	0.38	8			3.03	
Winter	0.99	0.98		0.82	0.40		0.68	0.36		0.83	0.69	0.83

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Polychaete Abundance
HABITAT:	Shallow

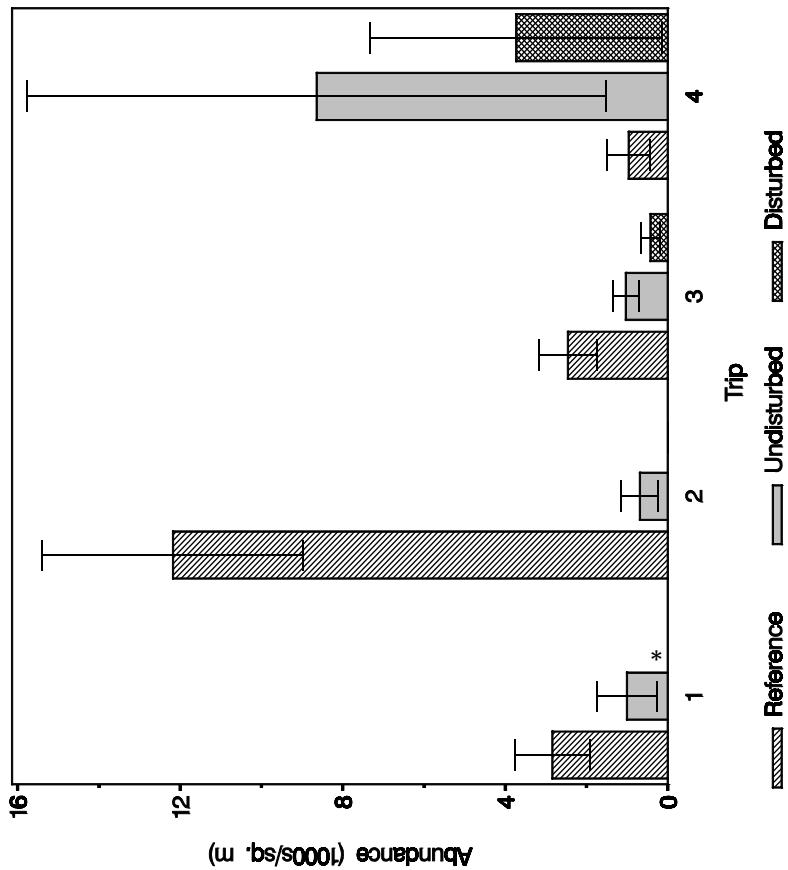


Figure SH-21. Mean and associated standard error of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-22. Mean (\bar{x}_r) and associated standard error (SE) of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Bald Head Island, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_r	SE	N	\bar{x}_r	SE	N	\bar{x}_r	SE	N	R_{du}	R_{dr}	R_{ur}
1	2840.00	920.43	4	1005.00	749.61	8	-	-	0	-	-	0.35
2	12180.00	3212.21	4	686.67	457.87	6	0.00	0.00	2	0.00	0.00	0.06
3	2460.00	712.65	4	1032.00	321.84	5	426.67	237.02	3	0.41	0.17	0.42
4	960.00	526.88	4	8640.00	7120.00	2	3733.33	3598.04	6	0.43	3.89	9.00
Spring	4610.00	2697.93	-	2840.92	2241.52	-	1386.67	1677.23	-	0.49	0.30	0.62

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: POLYCHAETE ABUNDANCE
HABITAT: SHALLOW

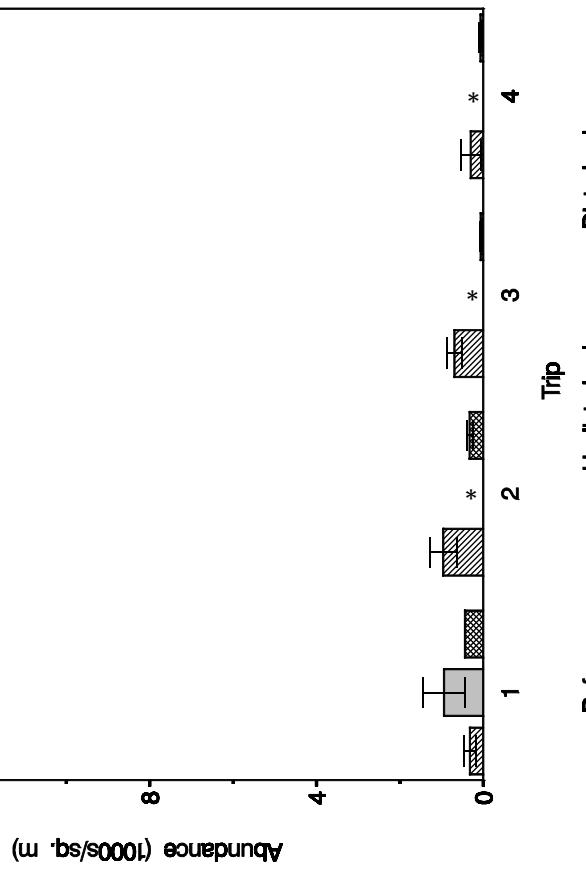


Figure SH-22. Mean and associated standard error of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-23. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_r	SE	N	\bar{x}_u	SE	N	\bar{x}_{dr}	SE	N	R_{du}	R_{dr}	R_{ur}
1	320.00	139.52	4	942.86	500.81	7	440.00		1	0.47	1.38	2.95
2	960.00	325.37	4		0	330.00	72.41	8			0.34	
3	690.00	178.42	4		0	60.00	20.00	8			0.09	
4	300.00	235.80	4		0	65.00	31.11	8			0.22	
Summer	567.50	196.10		942.86			223.75	99.39	0.24	0.39	1.66	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	POLYCHAETE ABUNDANCE
HABITAT:	SHALLOW

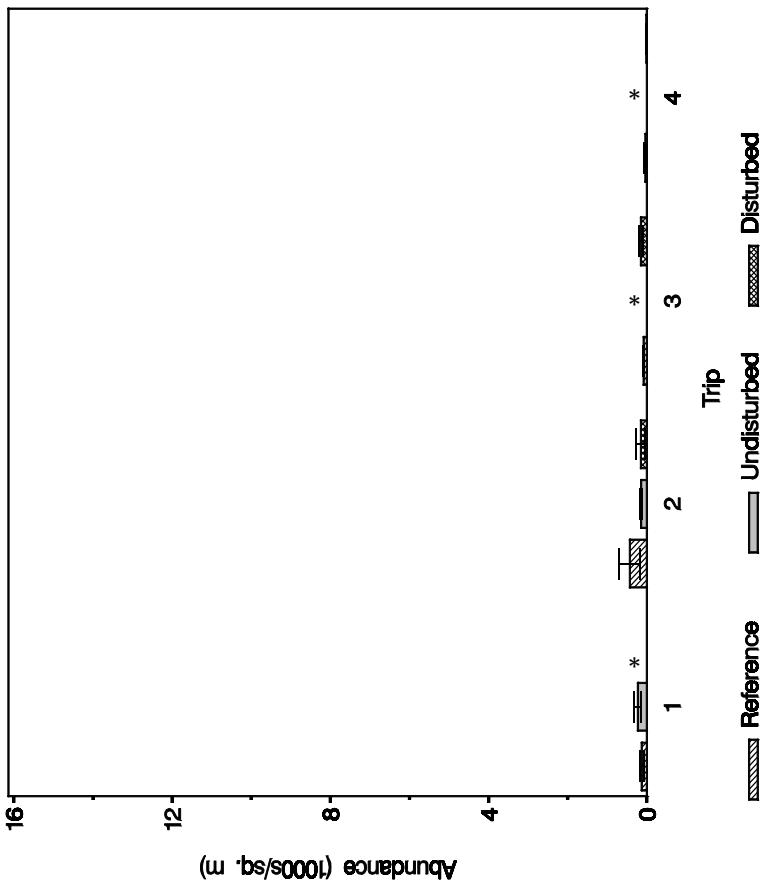


Figure SH-23. Mean and associated standard error of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-24. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	130.00	44.35	4	225.00	88.78	8	152.00	114.12	0	1.04	0.35	1.73
2	430.00	265.02	4	146.67	13.33	3	0	47.66	8	0	0.35	0.34
3	80.00	16.33	4				0	150.00	10	1.88		
4	40.00	23.09	4				0	10.00	6.55	8	0.25	
Fall	170.00	111.41		185.83	47.03		104.00	51.50	0.56	0.61	0.56	1.09

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: POLYCHAETE ABUNDANCE
HABITAT: SHALLOW

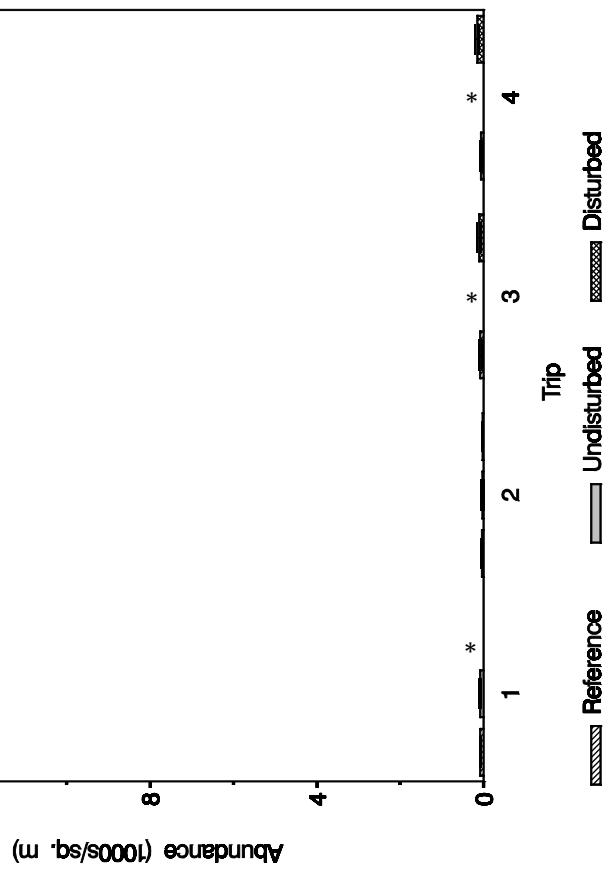


Figure SH-24. Mean and associated standard error of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-25. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	80.00	16.33	4	80.00	20.00	8			0			1.00
2	40.00	23.09	4	26.67	26.67	3	24.00	16.00	5	0.90	0.60	0.67
3	80.00	32.66	4			0	105.00	45.32	8		1.31	
4	60.00	20.00	4			0	150.00	47.06	8		2.50	
Winter	65.00	15.28		53.33	21.84		93.00	37.96	1.74	1.43	0.82	

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Polychaete Biomass
HABITAT:	Shallow

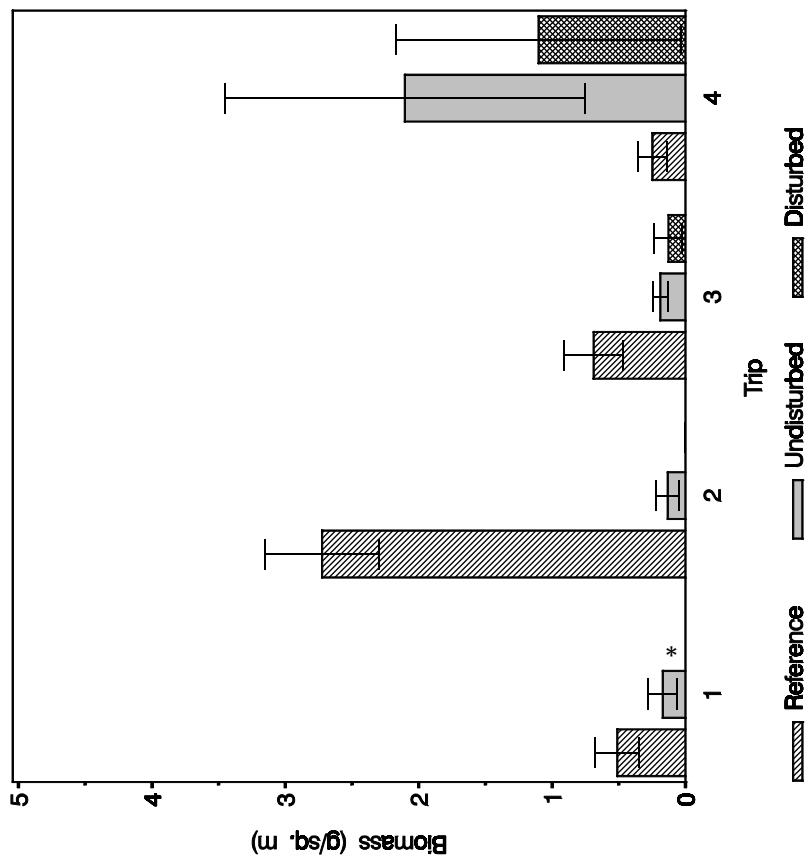


Figure SH-25. Mean and associated standard error of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-26. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.51	0.17	4	0.17	0.11	8			0			0.33
2	2.72	0.43	4	0.13	0.09	6	0.00	0.00	2	0.00	0.00	0.05
3	0.69	0.22	4	0.19	0.06	5	0.13	0.10	3	0.68	0.19	0.27
4	0.25	0.11	4	2.10	1.35	2	1.10	1.07	6	0.52	4.44	8.48
Spring	1.04	0.58		0.65	0.53		0.41	0.50	0.63	0.39	0.62	

SITE:	CASWELL BEACH
SEASON:	SUMMER
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	SHALLOW

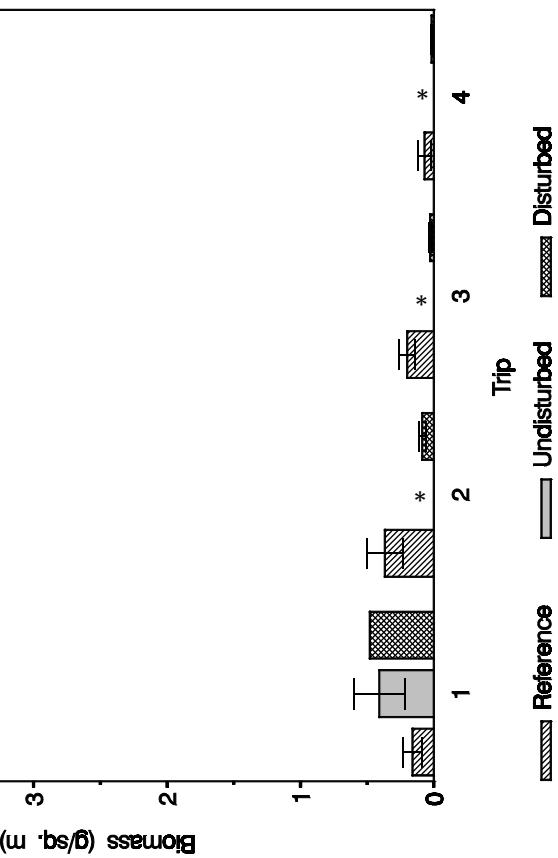


Figure SH-26. Mean and associated standard error of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-27. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.16	0.07	4	0.41	0.19	7	0.48	0.09	1	1.17	3.01	2.56
2	0.37	0.14	4				0	0.03	8		0.23	
3	0.20	0.06	4				0	0.01	8		0.14	
4	0.07	0.05	4				0	0.02	8		0.23	
Summer	0.20	0.08		0.41			0.15	0.11	0.37	0.77	0.77	2.05

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	SHALLOW

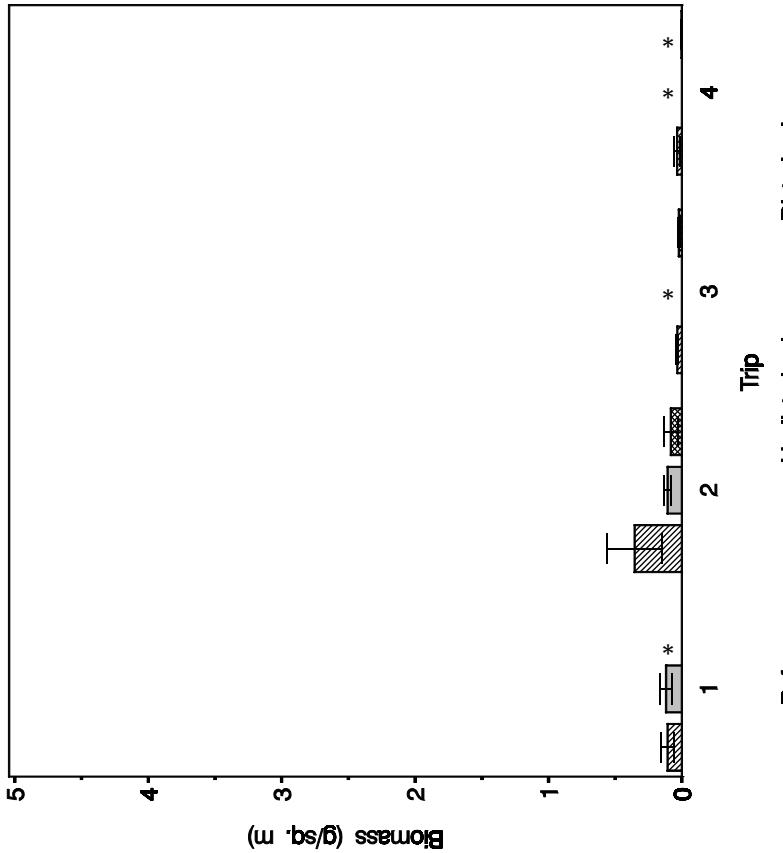


Figure SH-27. Mean and associated standard error of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-28. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.11	0.05	4	0.12	0.04	8			0			1.11
2	0.35	0.20	4	0.11	0.02	3	0.08	0.05	5	0.78	0.23	0.30
3	0.03	0.00	4			0	0.02	0.00	8		0.70	
4	0.04	0.02	4			0	0.00	0.00	8		0.08	
Fall	0.13	0.09		0.11	0.02		0.04	0.02	0.32	0.27	0.85	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	SHALLOW

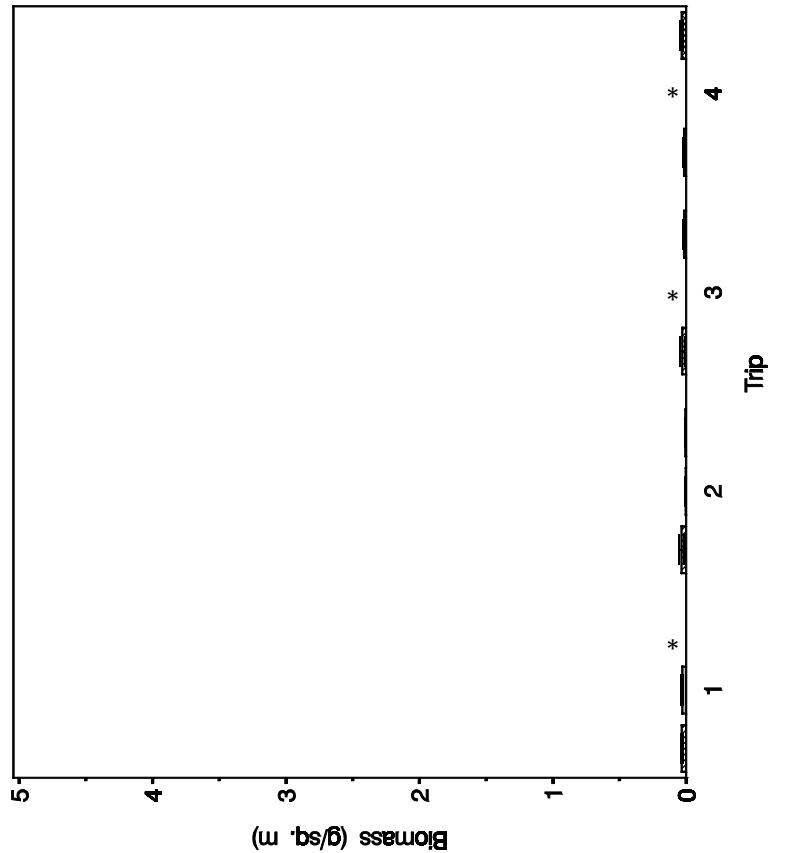


Figure SH-28. Mean and associated standard error of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-29. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	0.03	0.00	4	0.03	0.00	8			0			0.88
2	0.04	0.02	4	0.00	0.00	3	0.01	0.00	5	1.50	0.17	0.11
3	0.03	0.02	4			0	0.02	0.00	8		0.53	
4	0.02	0.00	4			0	0.03	0.01	8		2.06	
Winter	0.03	0.00		0.02	0.00		0.02	0.00		1.09	0.64	0.59

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Bivalve Abundance
HABITAT:	Shallow

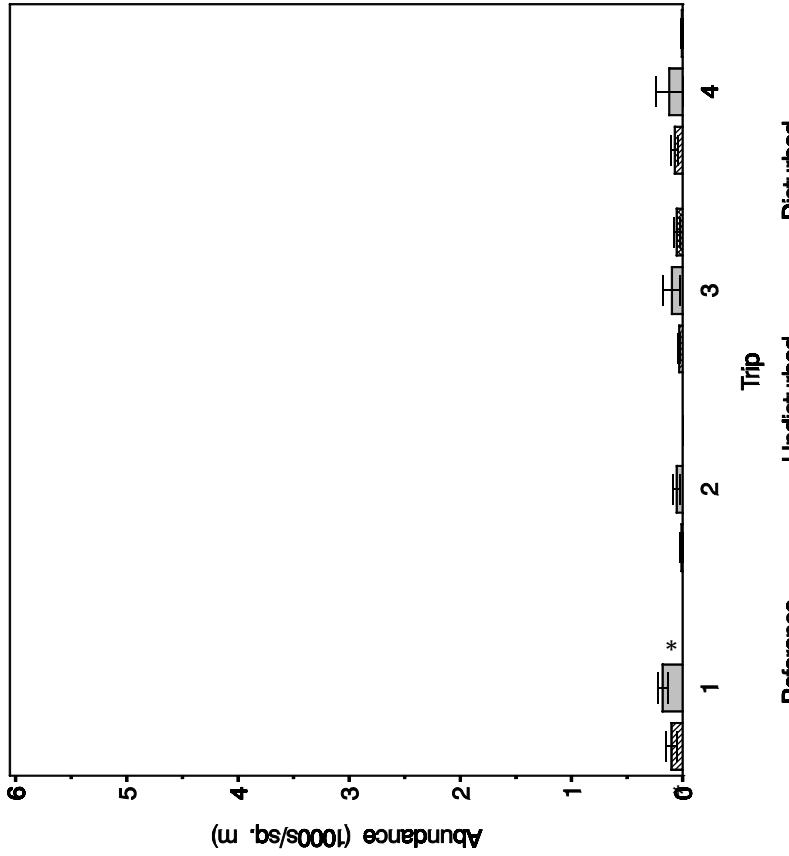


Figure SH-29. Mean and associated standard error of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-30. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	100.00	52.92	4	180.00	43.42	8			0			1.80
2	10.00	10.00	4	53.33	30.40	6	0.00	0.00	2	0.00	0.00	5.33
3	30.00	10.00	4	96.00	76.52	5	53.33	26.67	3	0.56	1.78	3.20
4	70.00	30.00	4	120.00	2	6.67	6.67	6	0.06	0.10	1.71	
Spring	52.50	25.50		112.33	40.45		20.00	16.30	0.18	0.38	0.38	2.14

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: BIVALVE ABUNDANCE
HABITAT: SHALLOW

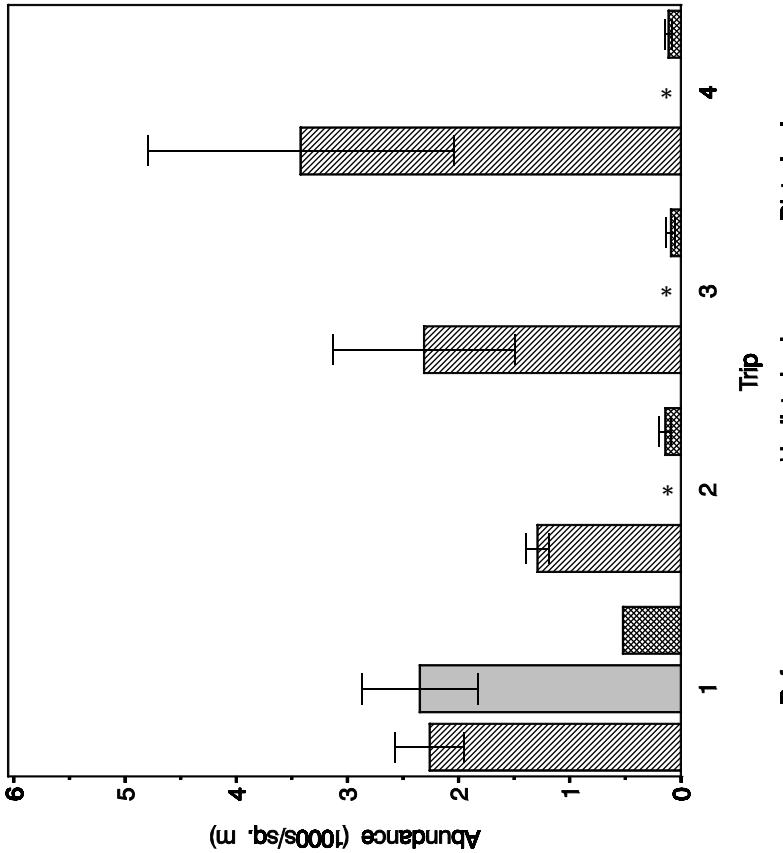


Figure SH-30. Mean and associated standard error of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-31. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	2260.00	312.20	4	2348.57	520.49	7	520.00	1	0.22	0.23	1.04	
2	1290.00	105.04	4		0	140.00	54.51	8		0.11		
3	2310.00	822.58	4		0	90.00	41.92	8		0.04		
4	3420.00	1375.84	4		0	110.00	30.00	8		0.03		
Summer	2320.00	597.44	2348.57		215.00	105.08	0.09	0.09	0.09	1.01		

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	BIVALVE ABUNDANCE
HABITAT:	SHALLOW

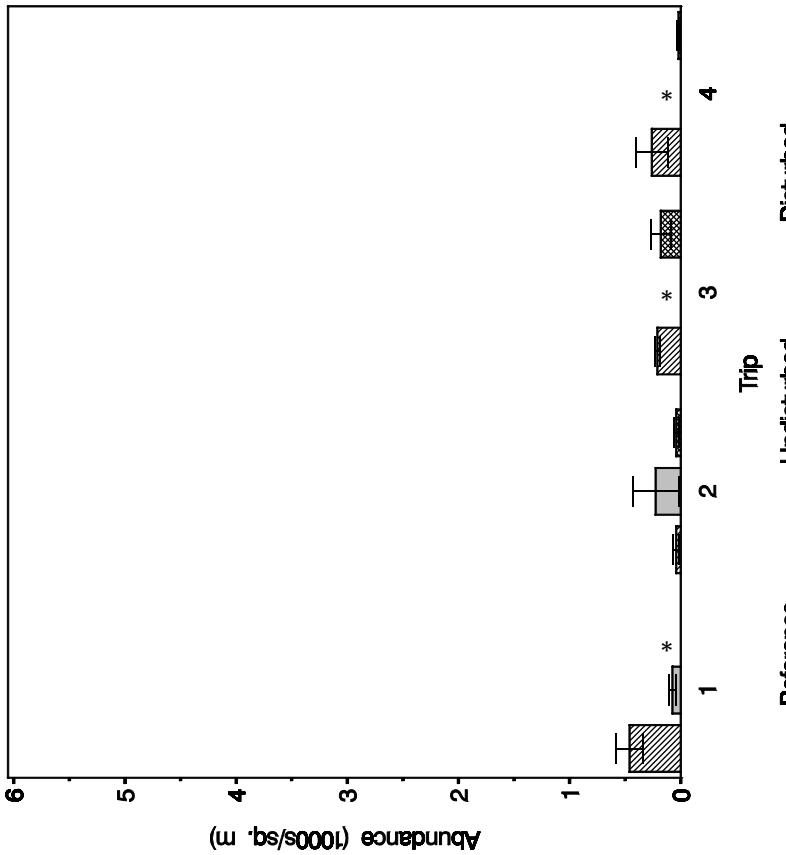


Figure SH-31. Mean and associated standard error of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-32. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	460.00	118.32	4	75.00	34.17	8			0			0.16
2	40.00	28.28	4	226.67	206.99	3	40.00	21.91	5	0.18	1.00	5.67
3	210.00	25.17	4		0	180.00	87.83	8			0.86	
4	260.00	146.52	4		0	20.00	10.69	8			0.08	
Fall	242.50	98.89		150.83	77.52		80.00	51.71	0.53	0.33	0.62	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	BIVALVE ABUNDANCE
HABITAT:	SHALLOW

Figure SH-32. Mean and associated standard error of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

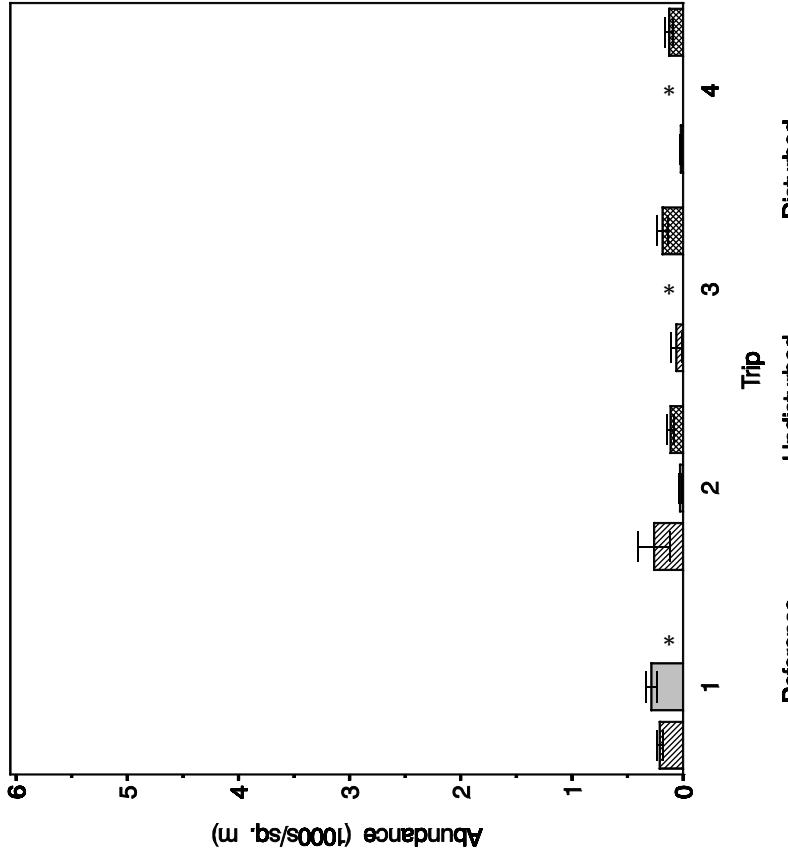


Table SH-33. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	210.00	25.17	4	285.00	50.39	8			0			1.36
2	260.00	146.52	4	26.67	13.33	3	112.00	29.39	5	4.20	0.43	0.10
3	60.00	47.61	4		0	185.00	50.67	8			3.08	
4	20.00	11.55	4		0	125.00	35.81	8			6.25	
Winter	137.50	69.79		155.83	93.89		140.67	28.23	0.90	1.02	1.13	

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	BIVALVE BIOMASS
HABITAT:	SHALLOW

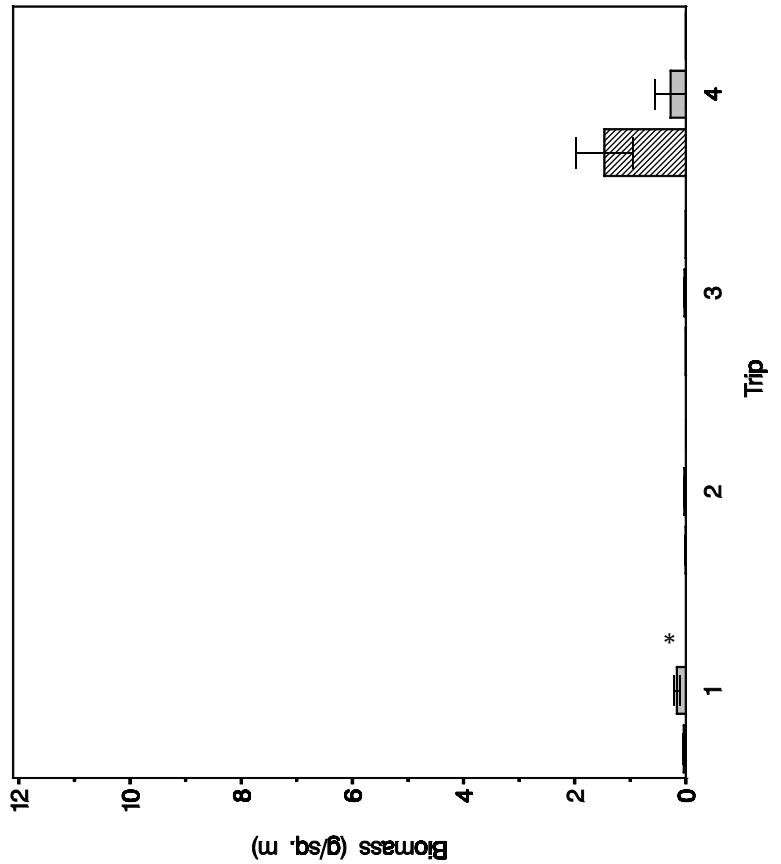


Figure SH-33. Mean and associated standard error of the total bivalve biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SH-34. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the shallow habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	0.04	0.02	4	0.16	0.05	8			0			4.13
2	0.00	0.00	4	0.03	0.01	6	0.00	0.00	2	0.00	0.00	6.33
3	0.00	0.00	4	0.02	0.02	5	0.00	0.00	3	0.18	1.14	6.51
4	1.47	0.52	4	0.27	0.27	2	0.00	0.00	6	0.00	0.00	0.19
Spring	0.38	0.38		0.12	0.08		0.00	0.00	0.01	0.00	0.00	0.32

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: BIVALVE BIOMASS
HABITAT: SHALLOW

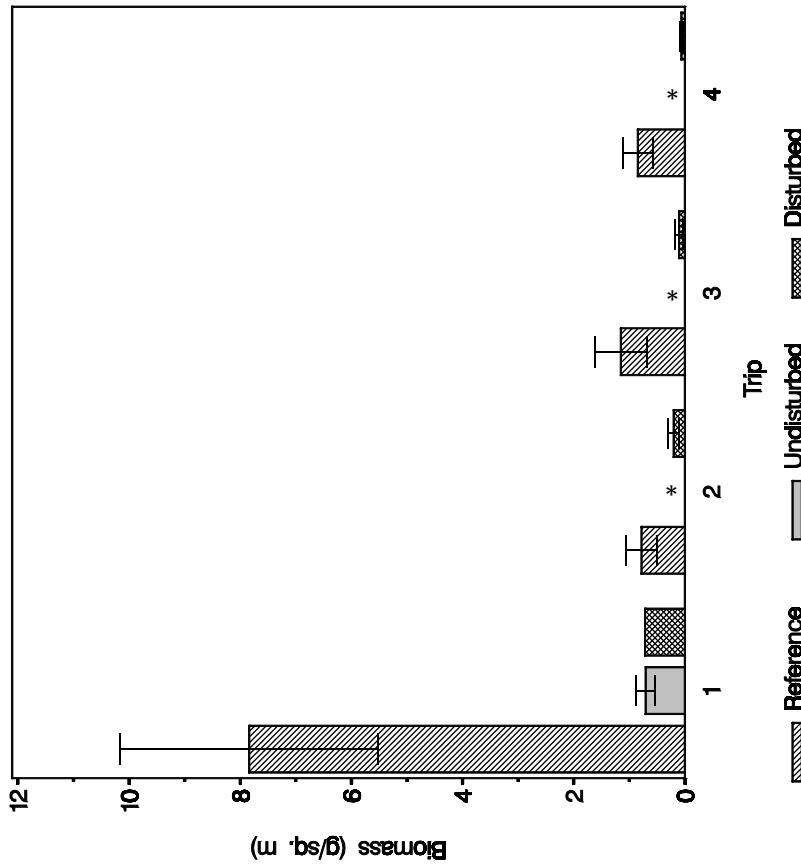


Figure SH-34. Mean and associated standard error of the total bivalve biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table SH-35. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the shallow habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	7.84	2.32	4	0.71	0.16	7	0.72	0.20	1	1.01	0.09	0.09
2	0.78	0.28	4				0	0.10	8		0.26	
3	1.15	0.47	4				0	0.10	0.07	8		0.09
4	0.85	0.27	4				0	0.06	0.02	8	0.07	
Summer	2.66	1.83		0.71			0.27		0.16	0.38	0.10	0.27

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	BIVALVE BIOMASS
HABITAT:	SHALLOW

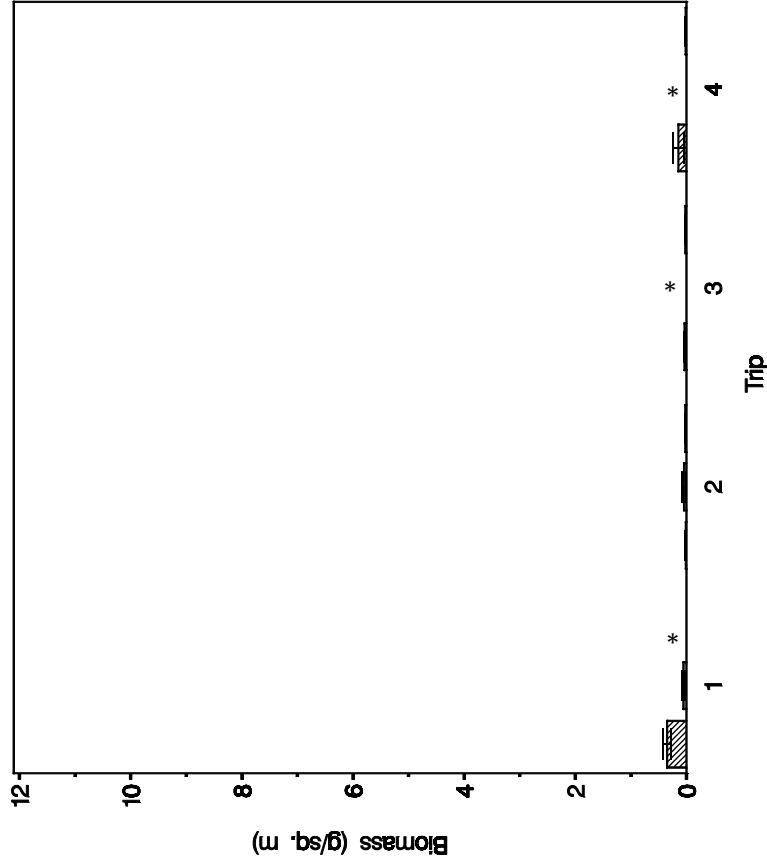


Figure SH-35. Mean and associated standard error of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SH-36. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the shallow habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	0.35	0.08	4	0.05	0.02	8			0			0.15
2	0.01	0.01	4	0.04	0.03	3	0.02	0.01	5	0.47	1.81	3.83
3	0.04	0.00	4		0	0.02	0.01	0.01	8		0.54	
4	0.15	0.10	4		0	0.02	0.01	0.01	8		0.11	
Fall	0.14	0.08		0.05	0.01		0.02	0.00		0.38	0.14	0.36

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	BIVALVE BIOMASS
HABITAT:	SHALLOW

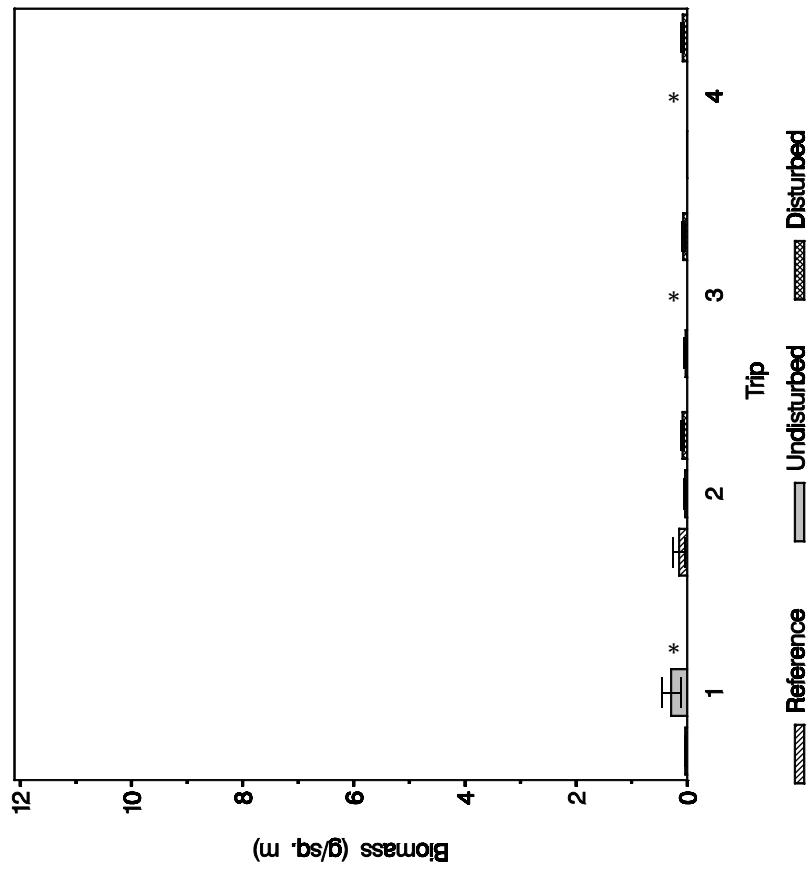


Figure SH-36. Mean and associated standard error of the total bivalve abundance within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SH-37. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the shallow habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	0.04	0.00	4	0.29	0.17	8	0.08	0.03	5	2.31	0.57	8.24
2	0.15	0.10	4	0.04	0.02	3	0.08	0.03	0	0.02	8	0.24
3	0.03	0.02	4			0	0.07	0.02	8			2.47
4	0.00	0.00	4			0	0.08	0.03	8			31.80
Winter	0.05	0.04		0.16	0.11		0.08	0.01		0.48	1.46	3.04

Table SH-38. Parameter interval estimates (90% confidence level) for differences between categories of stations in the shallow habitat. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0. Shaded intervals are statistically significant.

Parameter	Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
		CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Total Abundance	Spring	-3998.55	8108.38	-1322.53	10055.30	-2120.24	6743.19
Total Biomass		-0.92	1.95	0.03	2.77	-0.36	2.11
Total Diversity		-0.72	0.38	-0.31	0.79	-0.31	1.13
Crustacean Abundance		-1042.16	1556.99	35.45	2077.32	-5.32	1603.26
Crustacean Biomass		-1.53	1.95	0.13	3.09	-0.08	2.88
Polychaete Abundance		-4018.45	7556.62	-2018.35	8465.02	-3165.01	6073.51
Polychaete Biomass		-0.91	1.69	-0.63	1.90	-0.96	1.44
Bivalve Abundance		-138.72	19.05	-17.43	82.43	20.38	164.28
Bivalve Biomass		-0.39	0.90	-0.26	1.01	-0.01	0.24
Total Abundance				601.76	3170.74		
Total Biomass	Summer			-0.68	5.49		
Total Diversity				-0.71	-0.01		
Crustacean Abundance				-1294.64	129.64		
Crustacean Biomass				-0.73	5.51		
Polychaete Abundance				-18.99	706.49		
Polychaete Biomass				-0.18	0.27		
Bivalve Abundance				1104.10	3105.90		
Bivalve Biomass				-0.65	5.42		
Total Abundance		-749.71	718.04	-286.99	855.32	-400.06	1000.06
Total Biomass		-0.69	2.40	-0.57	2.52	-0.01	0.25
Total Diversity	Fall	-0.37	0.34	-0.41	0.55	-0.38	0.55
Crustacean Abundance		-687.19	483.85	-332.09	435.09	-400.19	706.52
Crustacean Biomass		-0.65	2.44	-0.50	2.57	-0.10	0.37
Polychaete Abundance		-215.37	183.71	-136.52	268.52	-33.25	196.92
Polychaete Biomass		-0.14	0.18	-0.06	0.25	0.02	0.13
Bivalve Abundance		-115.66	298.99	-21.63	346.63	-82.92	224.59
Bivalve Biomass		-0.05	0.23	-0.02	0.26	0.01	0.05
Total Abundance		-1416.85	351.85	-696.32	177.32	-703.78	1249.78
Total Biomass		-1.29	2.06	-1.16	2.14	-0.41	0.62
Total Diversity		-0.38	0.60	-0.39	0.27	-0.62	0.27
Crustacean Abundance	Winter	-1257.99	191.32	-630.85	164.19	-515.64	1115.64
Crustacean Biomass		-1.58	1.91	-1.42	2.02	-0.74	1.02
Polychaete Abundance		-32.30	55.64	-95.51	39.51	-111.92	32.59
Polychaete Biomass		-0.01	0.03	-0.01	0.03	-0.02	0.02
Bivalve Abundance		-211.37	174.70	-127.39	121.06	-146.61	176.94
Bivalve Biomass		-0.31	0.09	-0.10	0.05	-0.11	0.27
Total Abundance		-3152.23	3411.77	-1368.82	4507.47	-1126.37	4005.48
Total Biomass		-1.25	2.86	-0.71	3.35	-0.26	1.28
Total Diversity		-0.57	0.36	-0.47	0.41	-0.47	0.62
Crustacean Abundance		-1057.49	694.95	-607.91	753.94	-544.76	1053.33
Crustacean Biomass	All	-1.53	2.79	-0.74	3.41	-0.29	1.70
Polychaete Abundance		-2743.08	3437.86	-1728.01	3530.55	-1992.93	3100.69
Polychaete Biomass		-0.65	0.76	-0.45	0.84	-0.51	0.80
Bivalve Abundance		-521.73	514.20	60.98	1087.44	419.87	736.08
Bivalve Biomass		-1.01	2.10	-0.84	2.26	-0.02	0.35

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

DEEP HABITAT

Table DE-1. Deep species list and total percent composition

Family	Scientific Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference						
Cnidaria:Anthozoa	<i>Anthozoa</i>	0.00	0.03	0.39	0.25	0.2	0.16	0.04	0.25	0.04	0.05	0.04	0.05
Platyhelminthes:Turbellaria	<i>Renilla reniformis</i>	0.22	0.26	1.56	0.65	0.33	0.5	0.25	0.5	0.25	0.25	0.25	0.25
Nemertea	<i>Turbellaria</i>	0	0	15.31	3.51	0.8	0.61	0.07	0.61	0.56	0.56	0.81	0.81
Annelida:Polychaeta	<i>Nemertea</i>	0.01	0.03	0.03	0.07	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01
<i>Amastigidae</i>	<i>Amastigidae</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Anaitidae longipes</i>	<i>Anaitidae longipes</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Apophionospio pygmaea</i>	<i>Apophionospio pygmaea</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Arabellidae</i>	<i>Arabellidae</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Armandidae maculata</i>	<i>Armandidae maculata</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Asabellidae oculata</i>	<i>Asabellidae oculata</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Bhawania heteroseta</i>	<i>Bhawania heteroseta</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Brania wellfleetensis</i>	<i>Brania wellfleetensis</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Chaetopteridae</i>	<i>Chaetopteridae</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Cossuridae</i>	<i>Cossuridae</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Dipolydora socialis</i>	<i>Dipolydora socialis</i>	0	0.04	0.08	0.37	0.17	0.07	0.17	0.25	0.12	0.12	0.12	0.12
<i>Dispio uncinata</i>	<i>Dispio uncinata</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Drilonereis longa</i>	<i>Drilonereis longa</i>	0.11	0.19	0.19	0.08	0.31	0.16	0.07	0.02	0.02	0.02	0.02	0.02
<i>Eteone heteropoda</i>	<i>Eteone heteropoda</i>	0.04	0.03	0.03	0.47	0.13	0.34	1.24	1.6	1.13	0.3	1.13	1.13
<i>Eurysyllis lamelligera</i>	<i>Eurysyllis lamelligera</i>	0.16	0.02	0.02	0.47	0.13	2.81	1.34	2	0.14	0.73	0.73	0.73
<i>Glycera spp.</i>	<i>Glycera spp.</i>	0.12	0.02	0.02	0.16	0.16	0.07	0.07	0.02	0.02	0.02	0.02	0.02
<i>Glycera dibranchiata</i>	<i>Glycera dibranchiata</i>	0.11	0.08	0.08	0.34	0.34	2.81	1.34	2	1.13	0.3	1.13	1.13
<i>Goniadidae carolinae</i>	<i>Goniadidae carolinae</i>	0.05	0	0	0.96	3.9	0.36	0.03	0.03	0.03	0.02	0.02	0.02
<i>Leitoscoloplos</i> spp.	<i>Leitoscoloplos</i> spp.	0.05	0	0	0.96	0.96	0.03	0.03	0.03	0.03	0.01	0.01	0.01
<i>Magelona papillicornis</i>	<i>Magelona papillicornis</i>	0	0	0	0.96	0.96	0.03	0.03	0.03	0.03	0.02	0.02	0.02
<i>Maldanidae</i>	<i>Maldanidae</i>	0	0	0	0.96	0.96	0.03	0.03	0.03	0.03	0.01	0.01	0.01
<i>Mediomastus</i> spp.	<i>Mediomastus</i> spp.	0.02	0.09	0.26	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.06	0.06
<i>Mediomastus ambiseta</i>	<i>Mediomastus ambiseta</i>	0.01	0.02	1.82	0.5	0.2	0.02	0.02	0.02	0.02	0.16	0.16	0.16
<i>Microphthalmus abertrams</i>	<i>Microphthalmus abertrams</i>	0.02	0.09	0.26	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.05	0.05
<i>Nephtyidae</i>	<i>Nephtyidae</i>	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
<i>Nephrys buceria</i>	<i>Nephrys buceria</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Nereis lamellosa</i>	<i>Nereis lamellosa</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Notomastus lobatus</i>	<i>Notomastus lobatus</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Onuphis eremita</i>	<i>Onuphis eremita</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ophelina acuminata</i>	<i>Ophelina acuminata</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Orbiniidae</i>	<i>Orbiniidae</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Owenia fusiformis</i>	<i>Owenia fusiformis</i>	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table DE-1. Continued

Table DE-1. Continued

Family	Scientific Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
Mollusca:Bivalvia (cont'd)	<i>Mytilidae</i>	0		0.03 2.31	0.06 1.2	0.03 0.1	0.03 1.36	0.03 0.11					
	<i>Nucula proxima</i>	0.03	0.26 0.06	0.99 2.08	0.06 1.06	0.03 1.36	0.03 0.07						
	<i>Petricola pholadiformis</i>												
	<i>Spisula solidissima</i>												
	<i>Tellina</i> spp.	0.01	0.06	0.52	0.12								
	<i>Tellina agilis</i>												
	<i>Tellina iris</i>	0		0.23									
	<i>Zirfaea crispata</i>												
Arthropoda:Cirripedia	<i>Balanus</i> spp.	0	0.18	0.03									
Arthropoda:Stomatopoda	<i>Squilla empusa</i>												
Arthropoda:Mytidacea	<i>Bowmaniella</i> spp.	0.01	0.11	0.96	0.96	0.33	0.14	0.07	0.07	0.02			
Arthropoda:Cumacea	<i>Mysidae</i> spp.			1.14	0.09	0.63	0.14	0.1	0.1	0.02			
	<i>Cyclaspidiidae</i>	0.06	0.03	0.62	0.12	0.83	0.25	0.09	0.09	0.1			
	<i>Cyclaspis varians</i>												
	<i>Mancocuma stellaris</i>	0.45	0.46	0.16	0.03	0.03	0.11	0.06	0.06	0.15			
Arthropoda:Tanaidacea	<i>Oxyurostylis smithi</i>	0.38	0.2	0.03	0.06	0.1	0.02	0.06	0.06	0.02			
Arthropoda:Isopoda	<i>Tanaissus psammophilus</i>	0.24		0.13	0.25	0.03	0.09	0.01	0.01	0.12			
	<i>Ancinus depressus</i>	0.05	0.03	0.23	0.09	0.4	0.16	0.06	0.06	0.12			
	<i>Chiridotea coeca</i>	0.49	1.01	0.6	1.74	1.5	0.36	0.27	0.27	0.2			
	<i>Edotea</i> spp.			0.05	0.07	0.07	0.02	0.01					
Arthropoda:Amphipoda	<i>Acanthohaustorius</i> spp.												
	<i>Acanthohaustorius millsi</i>	0.24	0.04										
	<i>Acanthohaustorius similis</i>	5	11.27	0.91	9.57	10.15	16.66	0.07	0.07	0.02			
	<i>Americhelidium americanum</i>	0.05	0.04	0.81	0.5	1.76	0.27	0.3	16.85	19.22			
	<i>Ameroculodes</i> species complex	0.02	0			0.03	0.05	0.15	0.15	0.25			
	<i>Amphiporeia virginiana</i>	0				0.03	0.03			0.12			
	<i>Atylus</i> cf. <i>minikoi</i>									0.02			
	<i>Batea catharinensis</i>	0.02	5.83	0.13	0.03	0.03	0.26	8.46	5.21	10.43			
	<i>Bathyporeia parkei</i>												
	<i>Cerapus tubularis</i>												
	<i>Corophiidae</i>												
	<i>Eudevenopus hondurensis</i>	0.5	0	0.05	1.02	0.03	0.03	0.02	0.02	0.04			
	<i>Microprotopus raneyi</i>			0.86		0.03	0.03			0.03	0.02		
	<i>Monocorophium tuberculatum</i>			0.18		3.2	2.97						
	<i>Parahaustorius longimerus</i>	1.02	3.52	0.05									
	<i>Paraphoxus</i> spp.	0											
	<i>Protohaustorius</i> spp.												
	<i>Protohaustorius</i> cf. <i>deichmannae</i>	10.12	39.94	29.24	0.06	11.42	8.1	4.66	4.66	4.17			
	<i>Rhepoxynius epistomus</i>	0.12	0.25	1.87	7.67	48.2	54.55	57.9	57.9	49.86			
	<i>Tiron spiniferum</i>			0.18	0.03	2.13	1.09	1.57	1.57	0.37			
					0.03		0.05		0.05	0.05			

Table DE-1. Continued

Family	Scientific Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
Arthropoda:Decapoda	<i>Acetes americanus carolinae</i>			0.03	0.06	0.03	0.03						
	<i>Emerita talpoida</i>			0.18	0.19	0.03	0.03						
	<i>Ogyrides</i> spp.			0.02	0.03	0.65	0.03	0.23					
	<i>Ovalipes stephensi</i>	0.01	0.02	0.03	0.03	0.03	0.03	0.03					
	<i>Pagurus longicarpus</i>	0.23				0.03	0.03	0.03					
	<i>Pagurus pollicaris</i>					0.03	0.03	0.03					
	<i>Persephona mediterranea</i>					0.03	0.03	0.03					
	<i>Pinnixa cristata</i>					0.68	0.31	0.1					
	Pinnotheridae			0		0.39	0.19						
	Thalassinidea					0.03							
	<i>Trachypenaeus constrictus</i>					0.1							
	<i>Strigilla mirabilis</i>												
	Sipuncula												
	Echinodermata												
	Echinodermata:Ophiuroidea												
	Echinodermata:Echinoidea												
	<i>Mellita quinquesperforata</i>	0.02				0.03	0.16	0.5					
	Holothuroidea												
	Hemichordata												
	Chordata:Cephalochordata												
Total		100	100	100	100	100	100	100	100	100	100	100	100

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: TOTAL ABUNDANCE
HABITAT: DEEP

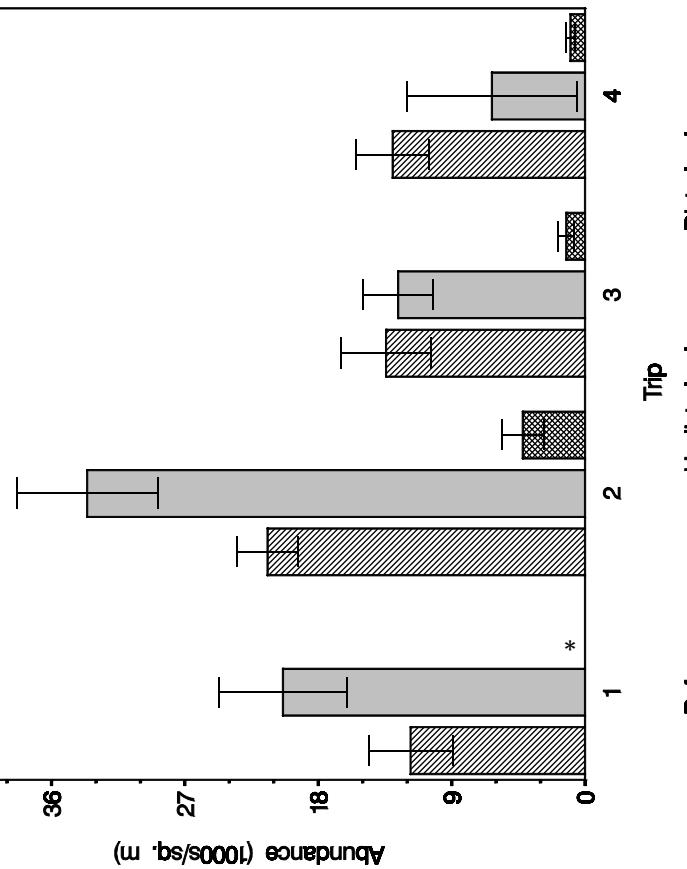
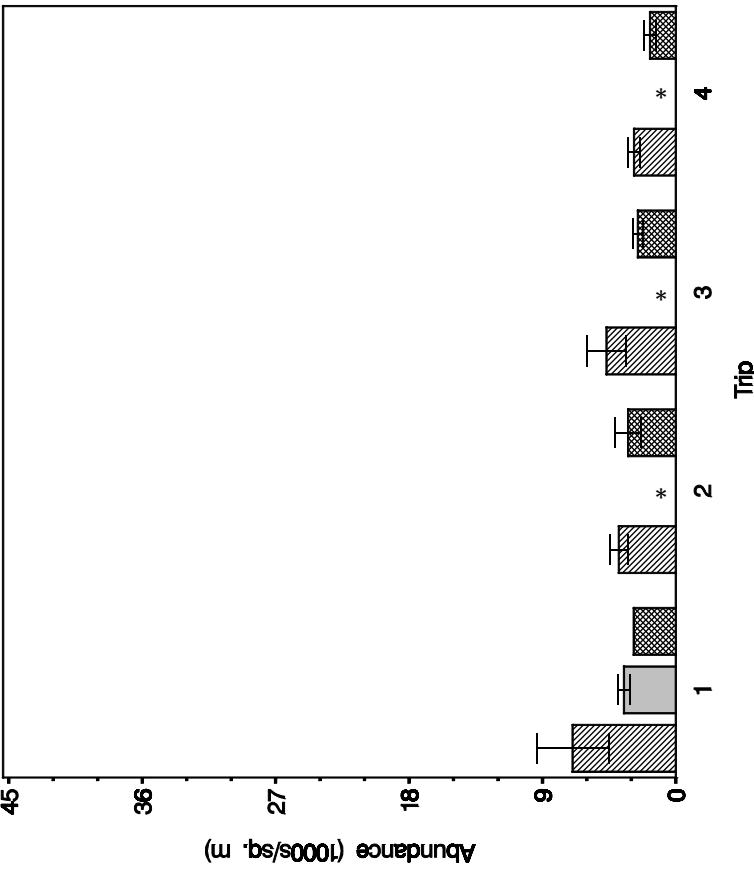


Figure DE-1. Mean and associated standard error of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-2. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	11767.06	2827.13	4	20383.55	4334.37	8			0			1.73
2	21420.48	2088.80	4	33581.86	4769.75	5	4189.40	1425.63	3	0.12	0.20	1.57
3	13420.47	3029.37	4	12604.56	2359.12	5	1265.15	542.66	3	0.10	0.09	0.94
4	12977.29	2448.32	4	6284.10	5715.92	2	988.64	321.67	6	0.16	0.08	0.48
Spring	14896.32	2563.58		18213.52	6246.66		2147.73	971.97		0.12	0.14	1.22

45
3627
18
9
0

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: TOTAL ABUNDANCE
HABITAT: DEEP

Figure DE-2. Mean and associated standard error of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-3. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	6954.55	2422.97	4	3496.76	380.38	7	2840.91		1	0.81	0.41	0.50
2	3852.28	607.18	4				3218.75		895.96	8		0.84
3	4670.46	1315.98	4				2559.66		340.80	8		0.55
4	2818.19	422.85	4				1738.64		406.58	8		0.62
Summer	4573.87	1132.57		3496.76			2589.49		462.94	0.74	0.57	0.76

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	TOTAL ABUNDANCE
HABITAT:	DEEP

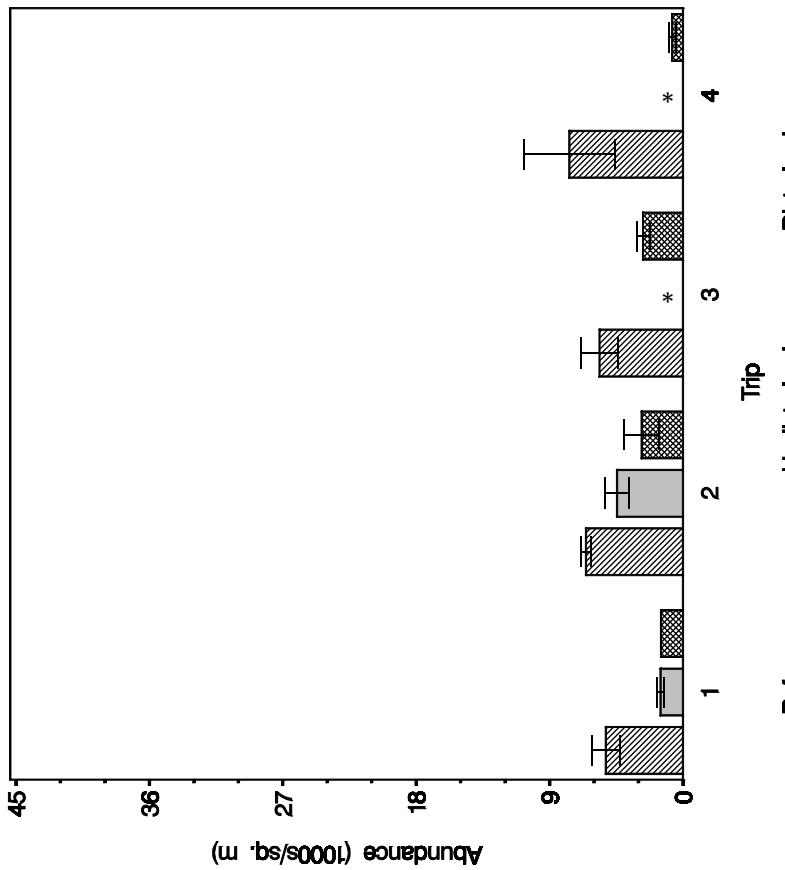


Figure DE-3. Mean and associated standard error of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-4. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	5198.87	932.07	4	1509.74	257.36	7	1477.27	1	0.98	0.28	0.29
2	6539.78	319.72	4	4454.55	835.21	4	2784.09	1184.31	4	0.63	0.43
3	5630.69	1227.04	4				2687.50	445.13	8		0.48
4	7670.46	3065.58	4				721.59	234.81	8		0.09
Fall	6259.95	1020.44		2982.15	1076.08		1917.62	607.07		0.64	0.31
											0.48

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: TOTAL ABUNDANCE
HABITAT: DEEP

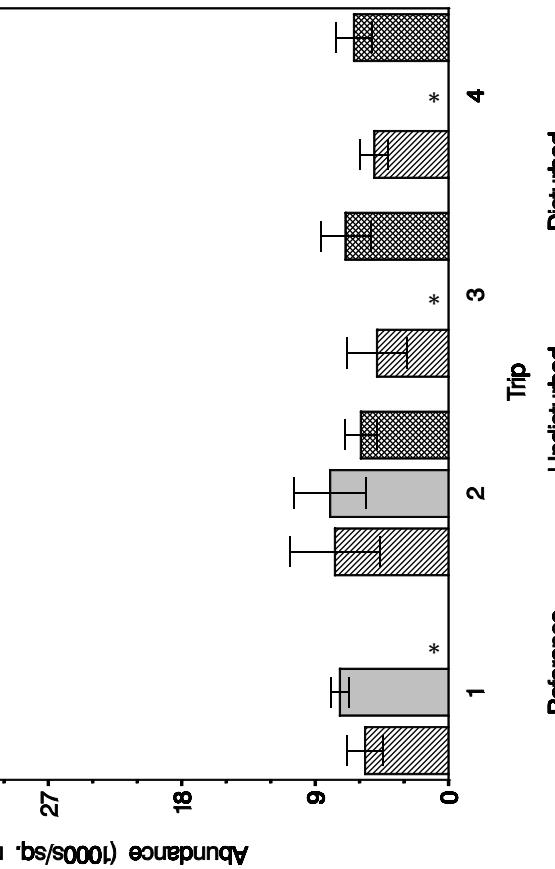


Figure DE-4. Mean and associated standard error of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-5. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	5630.69	1227.04	4	7329.55	608.19	8			0			1.30
2	7670.46	3065.58	4	7992.43	2406.39	3	5918.19	1090.07	5	0.74	0.77	1.04
3	4829.55	2033.39	4			0	6943.19	1691.31	8		1.44	
4	5011.37	938.56	4			0	6383.53	1233.73	8		1.27	
Winter	5785.52	1191.27		7660.99	719.03		6414.97	744.29		0.84	1.11	1.32

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: TOTAL BIOMASS
HABITAT: DEEP

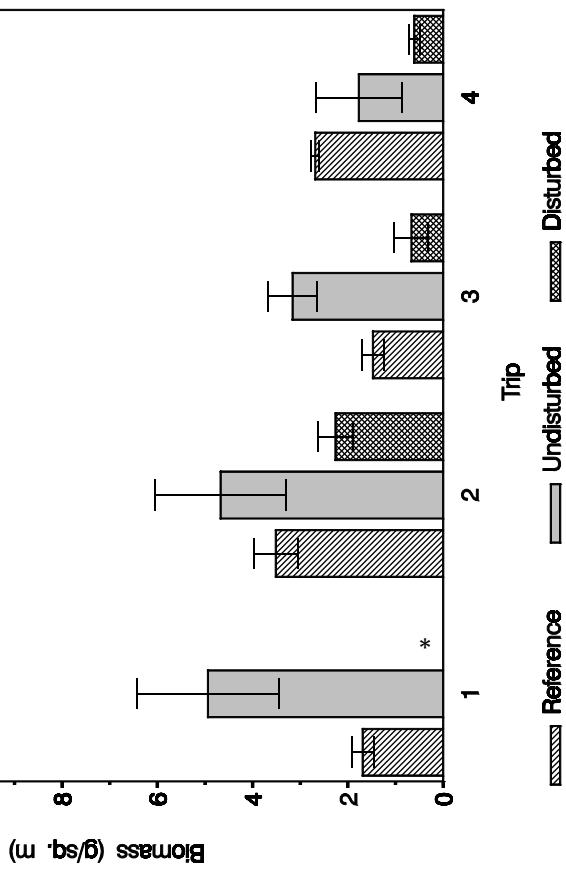


Figure DE-5. Mean and associated standard error of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-6. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}) are in the last three columns.

Trip(i)	Reference			Undisturbed			Disturbed			R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	1.69	0.23	4	4.94	1.49	8			0		2.92
2	3.51	0.46	4	4.67	1.38	5	2.26	0.36	3	0.48	0.64
3	1.47	0.24	4	3.16	0.51	5	0.67	0.36	3	0.21	0.45
4	2.69	0.08	4	1.77	0.90	2	0.61	0.11	6	0.34	0.23
Spring	2.34	0.49		3.64	0.96		1.18	0.49		0.32	0.50

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: TOTAL BIOMASS
HABITAT: DEEP

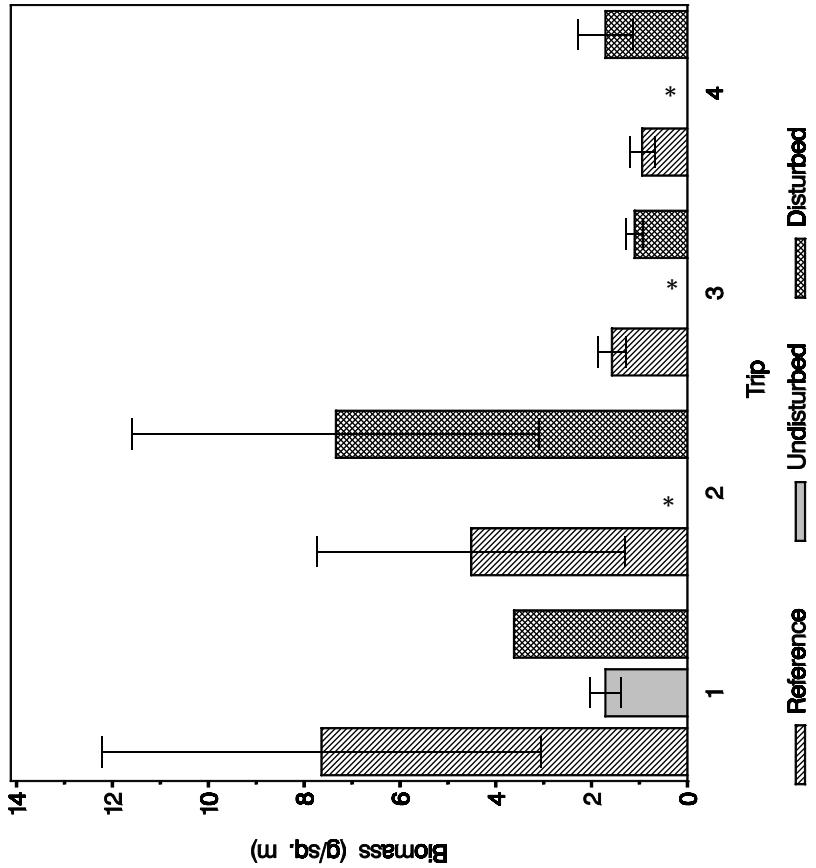


Figure DE-6. Mean and associated standard error of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-7. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip(i)	Reference				Undisturbed				Disturbed				
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}	
1	7.64	4.58	4	1.71	0.32	7	3.62			1	2.12	0.47	0.22
2	4.51	3.21	4		0	7.34	4.24	8				1.63	
3	1.58	0.29	4		0	1.10	0.17	8				0.70	
4	0.94	0.26	4		0	1.71	0.58	8				1.82	
Summer	3.67	2.08		1.71			3.44	1.98	2.01	0.94	0.47		

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: TOTAL BIOMASS
HABITAT: DEEP



Figure DE-7. Mean and associated standard error of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-8. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	1.77	0.57	4	1.18	0.17	7	1.04		1	0.89	0.59	0.67
2	1.35	0.23	4	1.71	0.62	4	1.89	0.68	4	1.11	1.40	1.26
3	2.34	0.98	4			0	1.15	0.21	8		0.49	
4	0.86	0.25	4			0	0.16	0.05	8		0.19	
Fall	1.58	0.43		1.44	0.27		1.06	0.40		0.74	0.67	0.91

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: TOTAL BIOMASS
HABITAT: DEEP

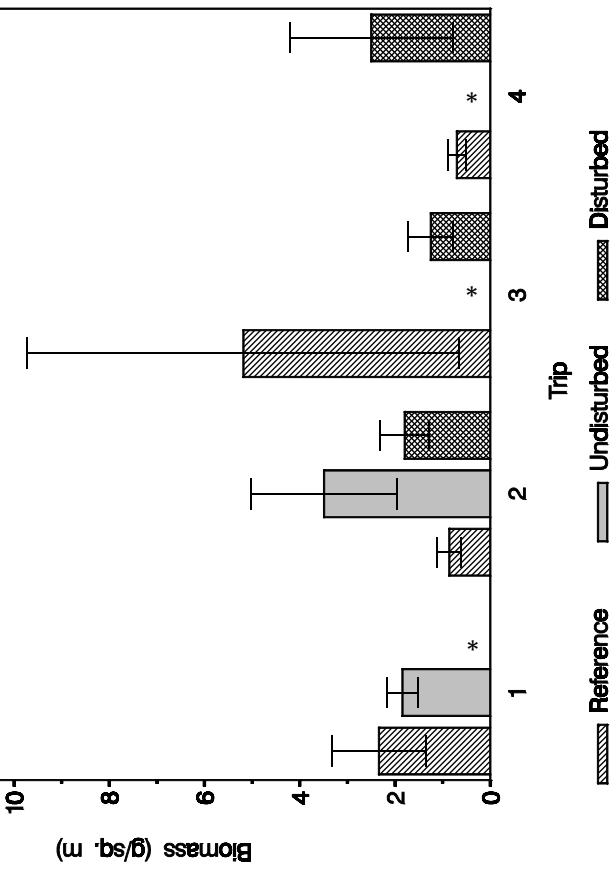


Figure DE-8. Mean and associated standard error of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-9. Mean (\bar{x}_i) and associated standard error (SE) of the total macrobenthic biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	2.34	0.98	4	1.85	0.33	8			0			0.79
2	0.86	0.25	4	3.49	1.52	3	1.80	0.51	5	0.52	2.09	4.05
3	5.18	4.54	4		0	1.25	0.47	8			0.24	
4	0.70	0.20	4		0	2.50	1.70	8			3.57	
Winter	2.27	1.56		2.67	0.72		1.85	0.64		0.69	0.81	1.17

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	DIVERSITY
HABITAT:	DEEP

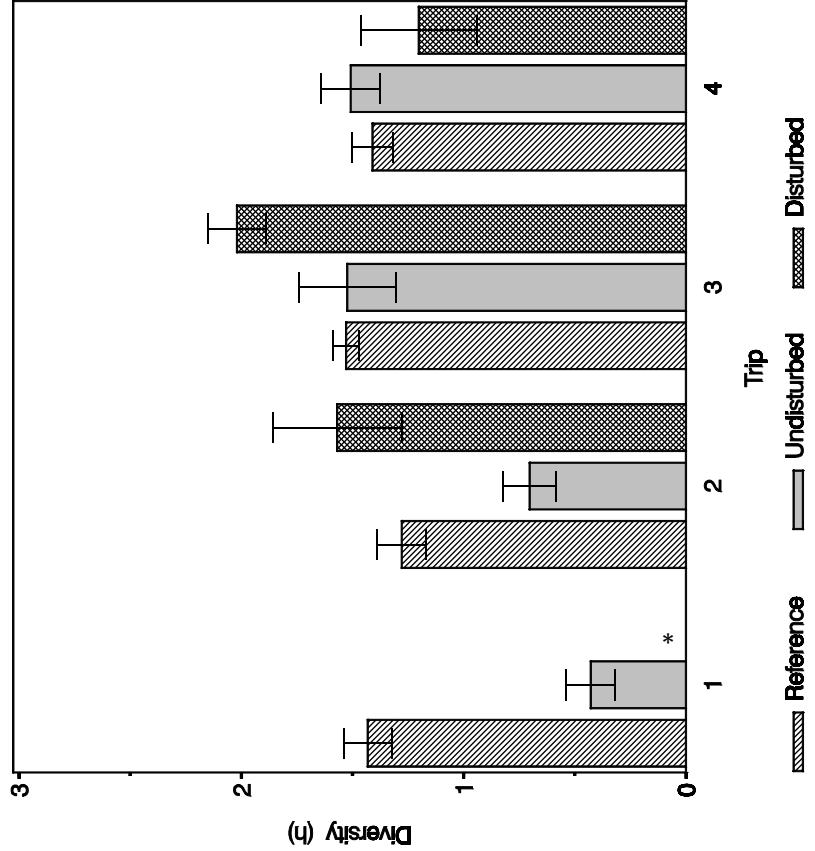


Figure DE-9. Mean and associated standard error of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-10. Mean (\bar{x}_i) and associated standard error (SE) of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	1.43	0.11	4	0.43	0.11	8			0			0.30
2	1.28	0.11	4	0.70	0.12	5	1.57	0.29	3	2.23	1.23	0.55
3	1.53	0.06	4	1.52	0.22	5	2.02	0.13	3	1.33	1.32	1.00
4	1.41	0.09	4	1.51	0.13	2	1.20	0.26	6	0.80	0.85	1.07
Spring	1.41	0.07		1.04	0.29		1.60	0.24	1.53	1.13	0.74	

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: DIVERSITY
HABITAT: DEEP

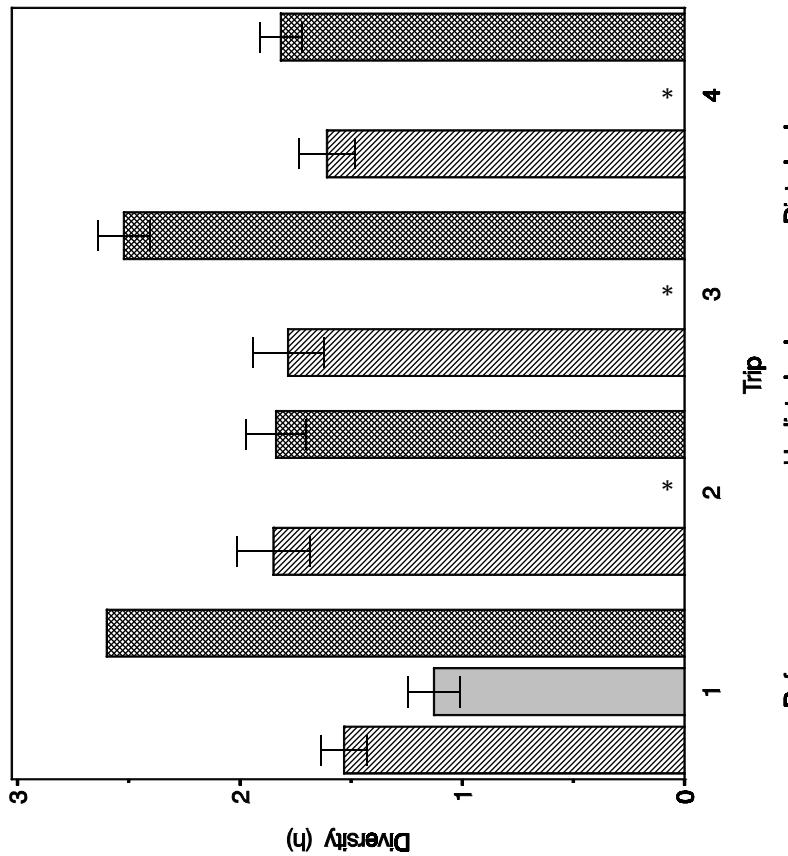


Figure DE-10. Mean and associated standard error of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-11. Mean (\bar{x}_r) and associated standard error (SE) of the macrobenthic diversity within the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_r	SE	N	\bar{x}_r	SE	N	\bar{x}_r	SE	N	R_{du}	R_{dr}	R_{ur}
1	1.53	0.10	4	1.13	0.12	7	2.60		1	2.31	1.70	0.74
2	1.85	0.17	4				0	1.84	0.14	8		0.99
3	1.78	0.16	4				0	2.52	0.12	8		1.41
4	1.61	0.13	4				0	1.82	0.09	8		1.13
Summer	1.69	0.10		1.13			2.19	0.22		1.95	1.30	0.67

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: DIVERSITY
HABITAT: DEEP

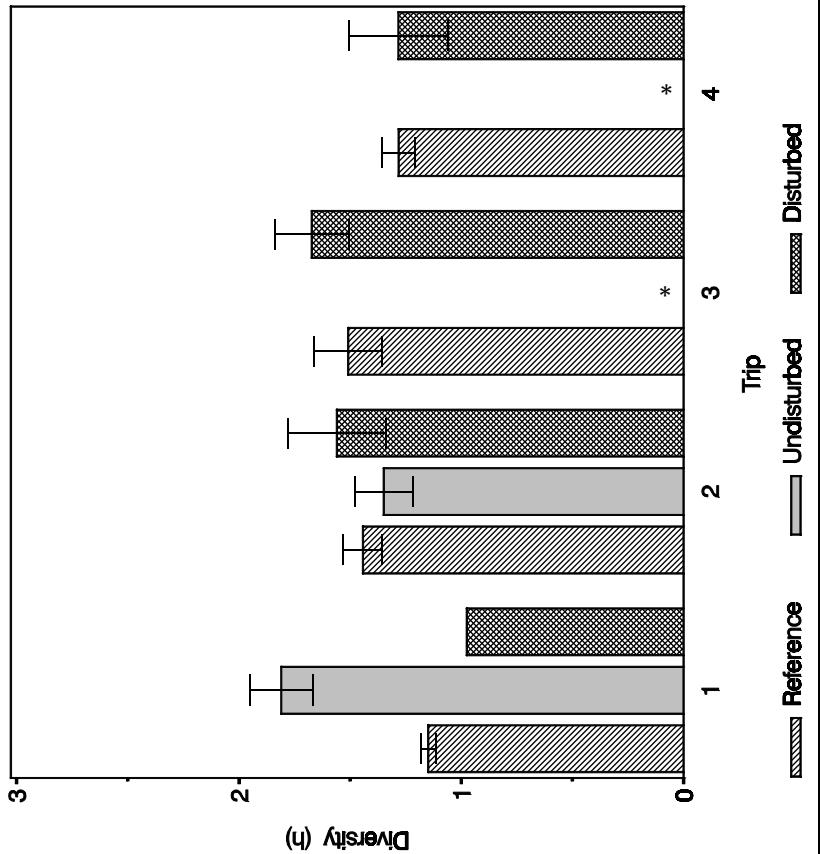


Figure DE-11. Mean and associated standard error of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-12. Mean (\bar{x}_i) and associated standard error (SE) of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{du}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	1.15	0.03	4	1.81	0.14	7	0.97		1	0.54	0.85	1.58
2	1.44	0.09	4	1.35	0.13	4	1.56	0.22	4	1.16	1.08	0.94
3	1.51	0.15	4		0	1.67	0.17	8			1.11	
4	1.28	0.07	4		0	1.28	0.22	8			1.00	
Fall	1.35	0.09		1.58	0.18		1.37	0.19	0.87	1.02	1.02	1.17

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: DIVERSITY
HABITAT: DEEP

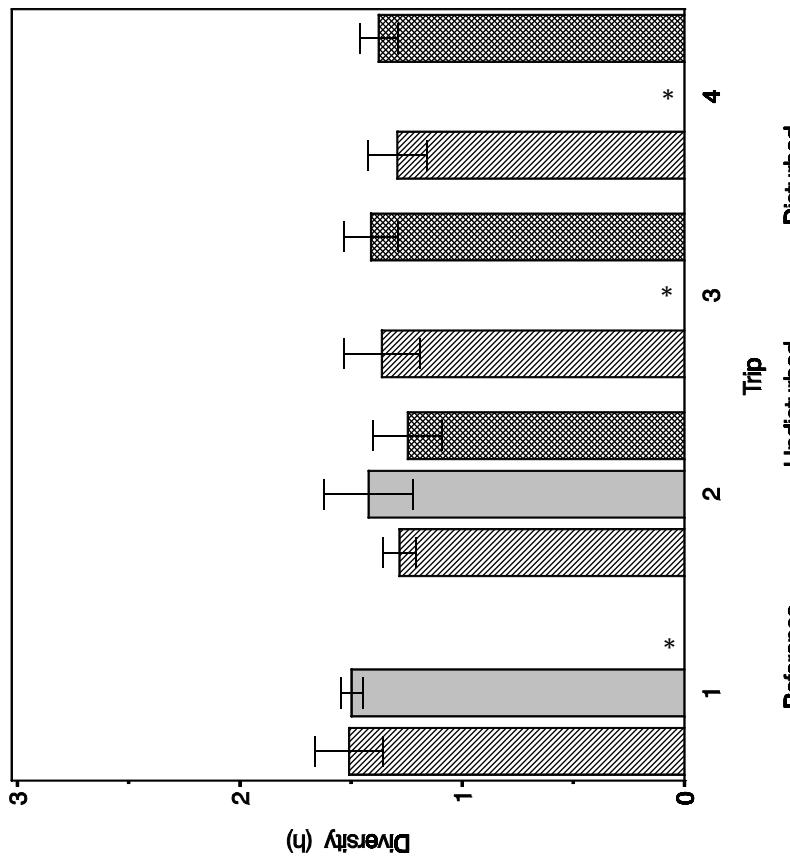


Figure DE-12. Mean and associated standard error of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-13. Mean (\bar{x}_i) and associated standard error (SE) of the macrobenthic diversity within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	1.51	0.15	4	1.50	0.05	8			0			0.99
2	1.28	0.07	4	1.42	0.20	3	1.24	0.15	5	0.88	0.97	1.11
3	1.36	0.17	4			0	1.41	0.12	8		1.04	
4	1.29	0.13	4			0	1.38	0.08	8		1.06	
Winter	1.36	0.09		1.46	0.06		1.34	0.07		0.92	0.99	1.07

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: DEEP

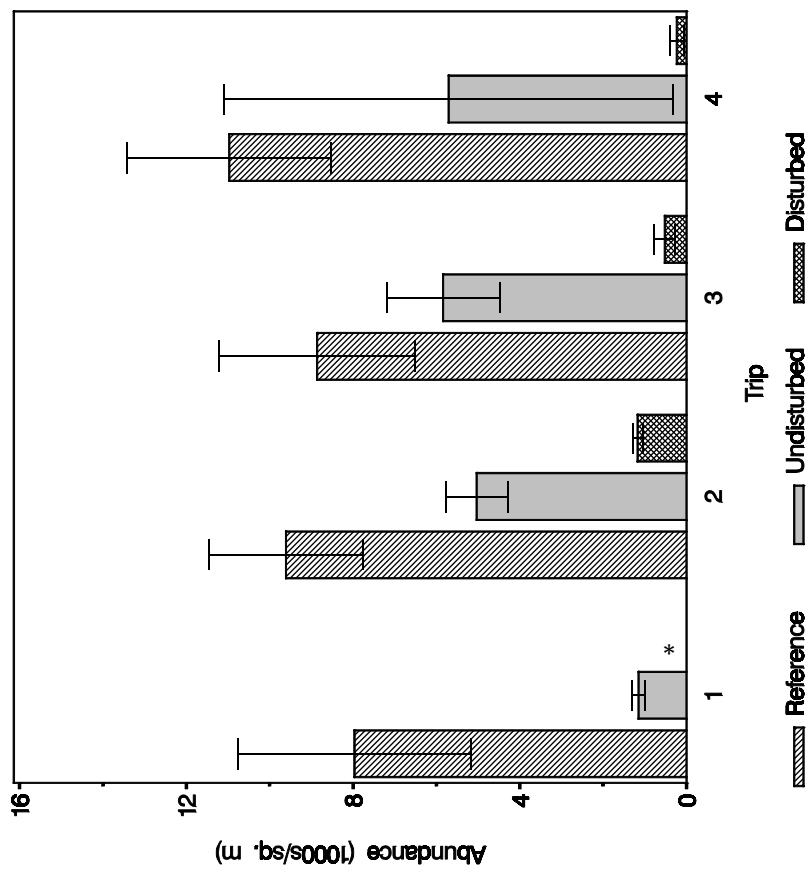


Figure DE-13. Mean and associated standard error of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-14. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_r	SE	N	\bar{x}_u	SE	N	R_{du}	R_{dr}	R_{ur}
1	7965.92	2786.71	4	1150.57	162.64	8			0			0.14
2	9607.97	1837.67	4	5036.37	740.60	5	1174.24	118.34	3	0.23	0.12	0.52
3	8863.65	2350.18	4	5840.92	1355.56	5	522.73	249.31	3	0.09	0.06	0.66
4	10971.60	2447.99	4	5704.55	5386.37	2	234.85	170.85	6	0.04	0.02	0.52
Spring	9352.28	1349.15		4433.10	1450.94		643.94	257.52	0.15	0.07	0.07	0.47

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: DEEP

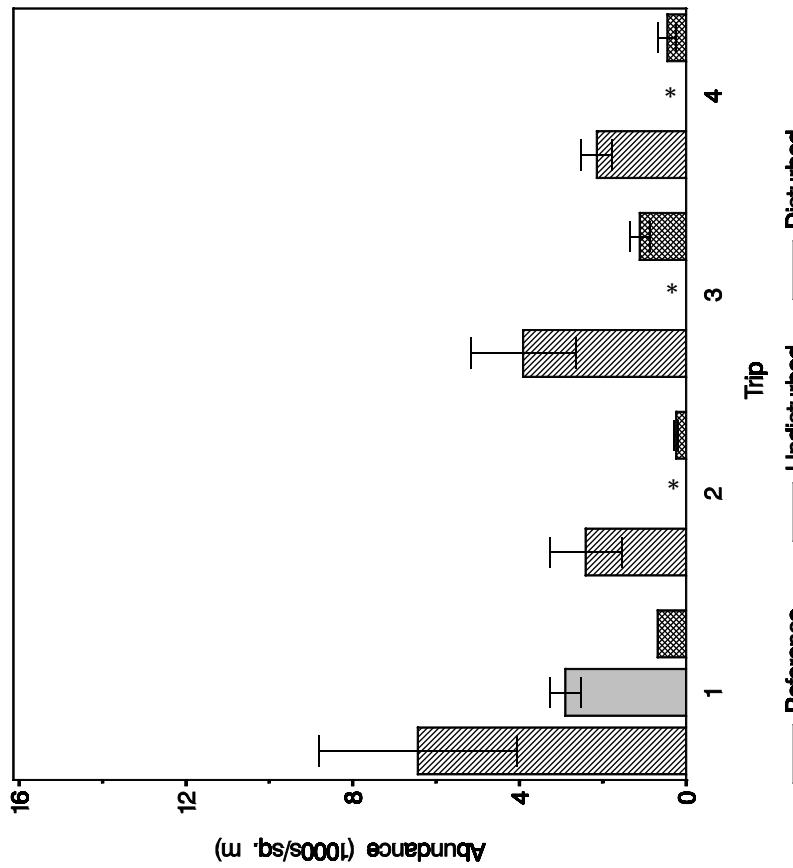


Figure DE-14. Mean and associated standard error of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-15. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	6437.51	2372.23	4	2896.11	373.67	7	681.82	1	0.24	0.11	0.45	
2	2409.09	862.19	4		0		238.64	43.16	8		0.10	
3	3909.10	1256.63	4		0	1113.64	232.93	8			0.28	
4	2142.05	371.76	4		0	451.71	213.44	8			0.21	
Summer	3724.44	1214.33		2896.11			621.45	214.36	0.21	0.17	0.78	

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: DEEP

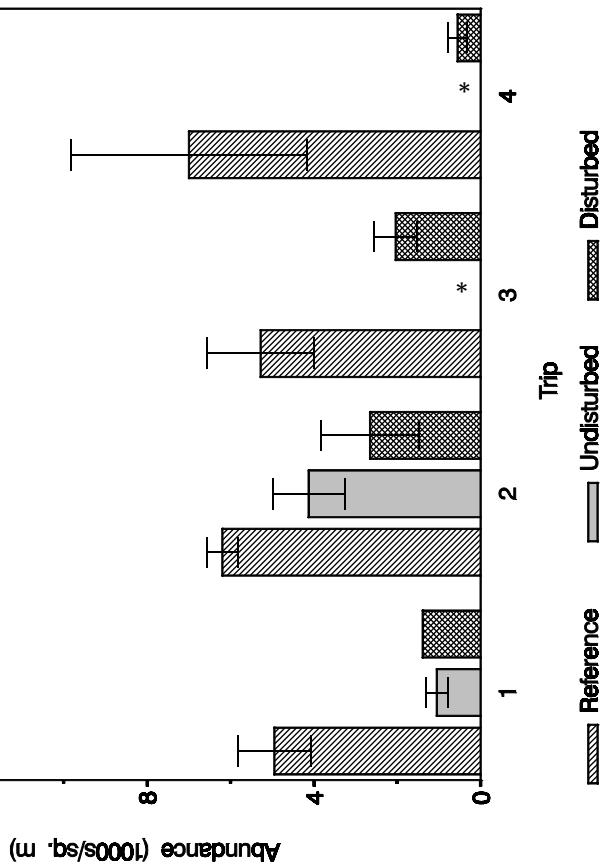


Figure DE-15. Mean and associated standard error of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-16. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	4948.87	883.03	4	1051.95	264.38	7	1386.37	1	1.32	0.28	0.21	
2	6193.19	367.70	4	4125.01	861.67	4	2653.41	1183.18	4	0.64	0.43	0.67
3	5278.42	1280.23	4		0	2039.78	521.98	8		0.39		
4	7000.01	2827.32	4		0	551.14	218.40	8		0.08		
Fall	5855.12	934.95		2588.48	1122.09		1657.67	576.63		0.64	0.28	0.44

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: CRUSTACEAN ABUNDANCE
HABITAT: DEEP

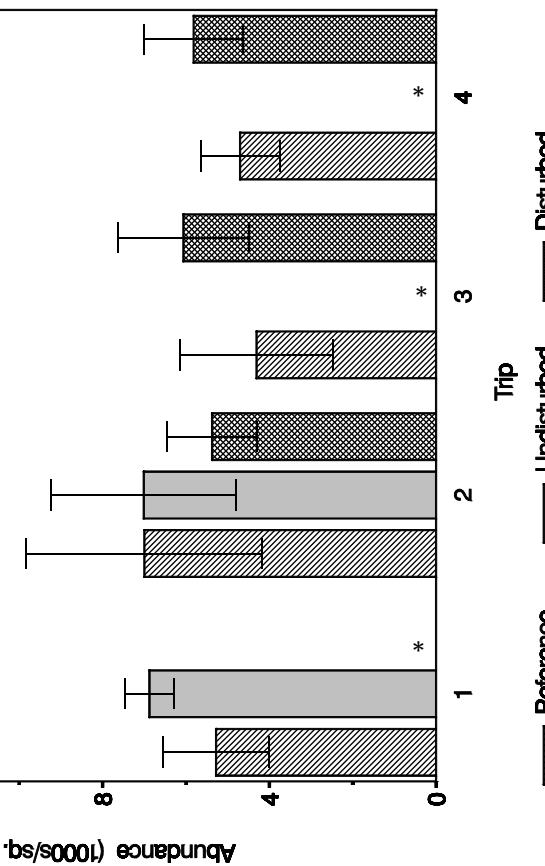


Figure DE-16. Mean and associated standard error of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-17. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	5278.42	1280.23	4	6877.85	586.55	8			0			1.30
2	7000.01	2827.32	4	7015.16	2212.28	3	5372.73	1077.80	5	0.77	0.77	1.00
3	4306.82	1829.17	4			0	6062.51	1564.58	8		1.41	
4	4698.87	942.86	4			0	5815.35	1188.58	8		1.24	
Winter	5321.03	1104.43		6946.50	631.35		5750.20	683.64		0.83	1.08	1.31

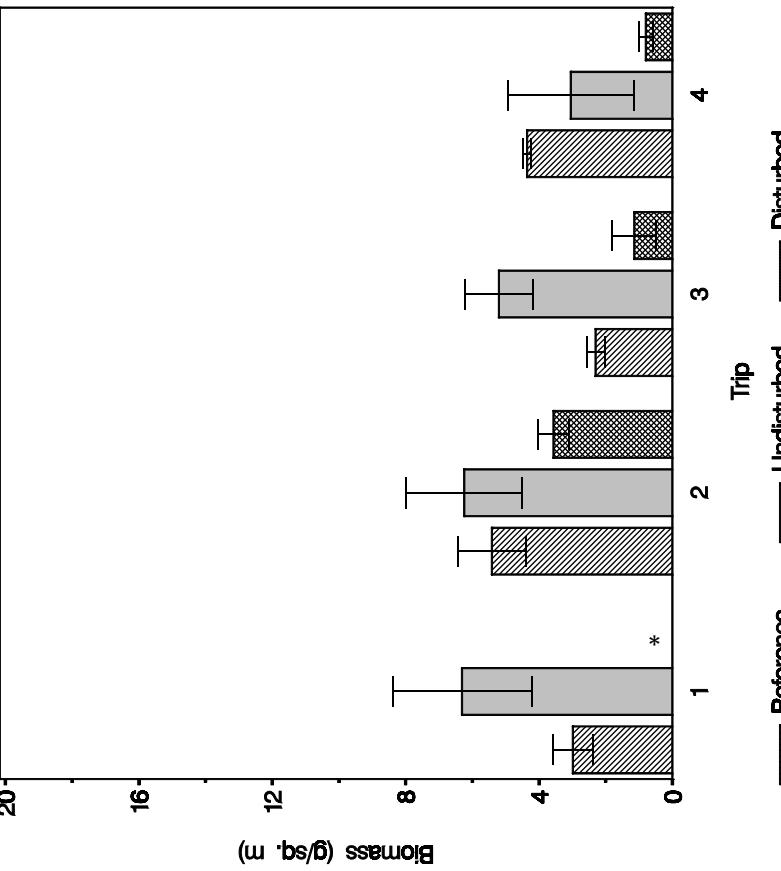


Figure DE-17. Mean and associated standard error of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-18.

Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Time	Reference			Undisturbed			Disturbed			R_{du}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	2.98	0.60	4	6.31	2.09	8			0		2.11
2	5.41	1.02	4	6.24	1.75	5	3.57	0.45	3	0.57	0.66
3	2.30	0.26	4	5.21	1.01	5	1.14	0.66	3	0.22	0.50
4	4.36	0.13	4	3.05	1.90	2	0.80	0.20	6	0.26	0.18
Spring	3.76	0.76		5.20	1.17		1.83	0.78		0.35	0.49
										1.38	

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: CRUSTACEAN BIOMASS
HABITAT: DEEP

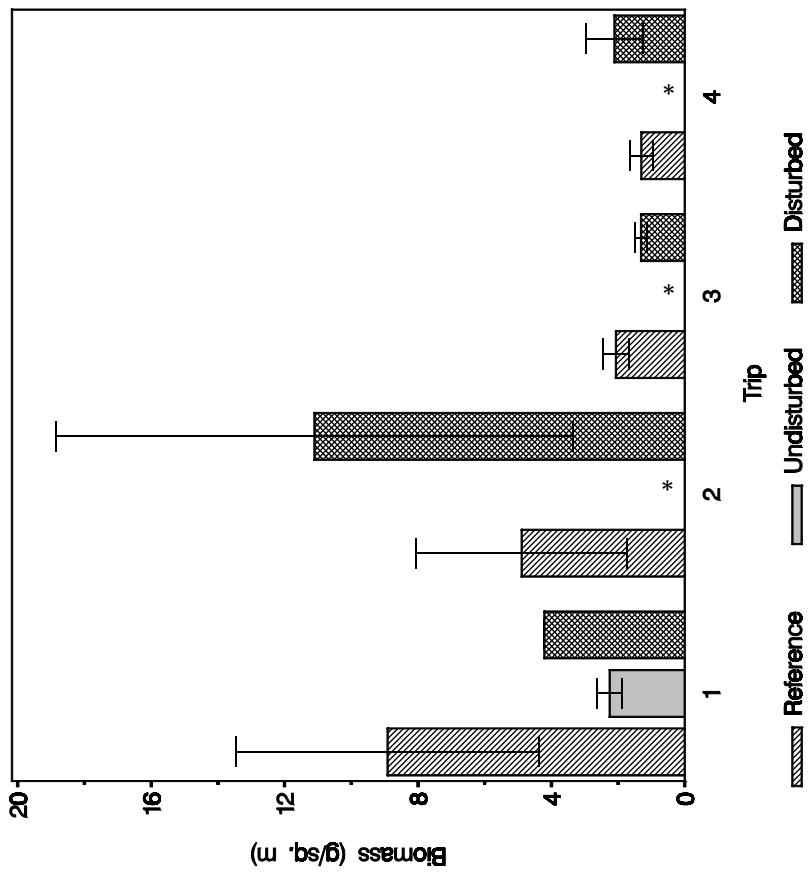


Figure DE-18. Mean and associated standard error of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-19. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Time	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	8.91	4.55	4	2.25	0.37	7	4.21		1	1.87	0.47	0.25
2	4.89	3.17	4		0	11.10	7.76	8			2.27	
3	2.06	0.39	4		0	1.31	0.19	8			0.64	
4	1.30	0.35	4		0	2.11	0.85	8			1.62	
Summer	4.29	2.21		2.25			4.68	3.38	2.08	1.09	0.52	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	CRUSTACEAN BIOMASS
HABITAT:	DEEP

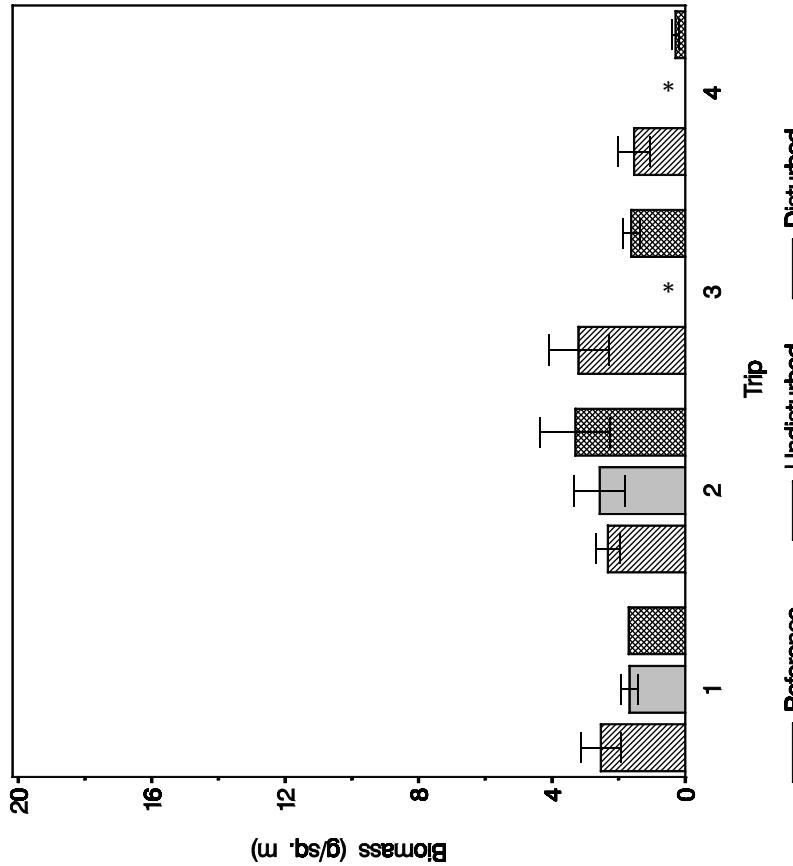


Figure DE-19. Mean and associated standard error of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-20. Mean (\bar{x}_i) and associated standard error (SE) of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Time	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	2.53	0.60	4	1.67	0.26	7	1.70		1	1.01	0.67	0.66
2	2.32	0.36	4	2.57	0.76	4	3.30	1.05	4	1.28	1.42	1.11
3	3.20	0.90	4			0	1.62	0.25	8		0.51	
4	1.54	0.48	4			0	0.30	0.10	8		0.19	
Fall	2.40	0.46		2.12	0.41		1.73	0.68	0.81	0.72	0.88	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	CRUSTACEAN BIOMASS
HABITAT:	DEEP

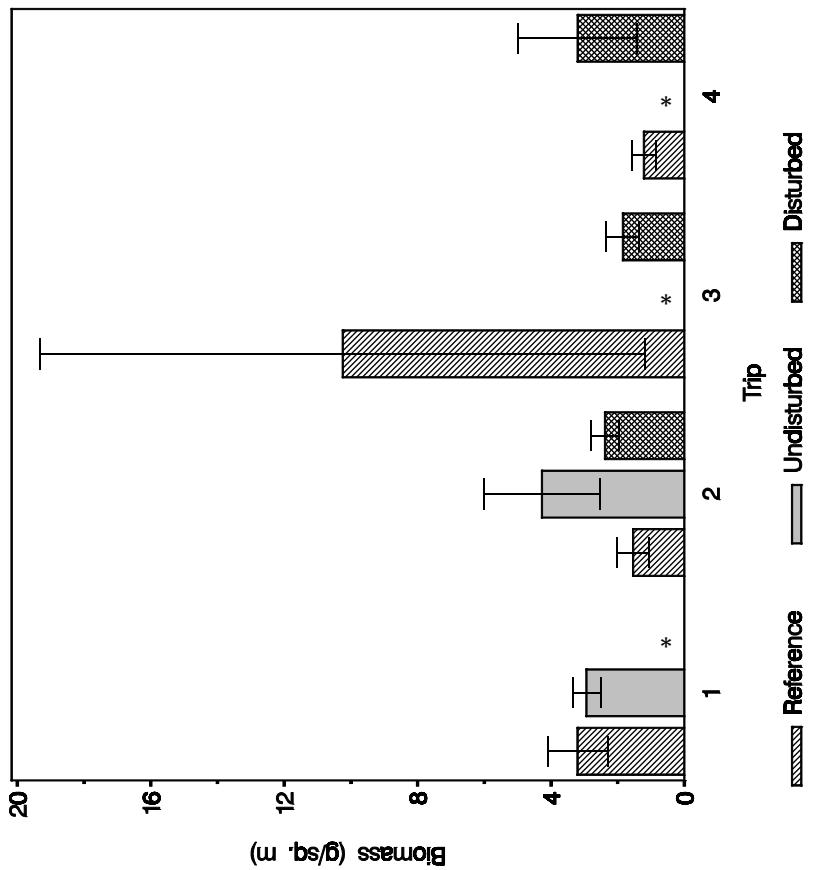


Figure DE-20. Mean and associated standard error of the total crustacean biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-21. Mean (\bar{x}_i) and associated standard error (SE) total crustacean abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Time	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	3.20	0.90	4	2.93	0.42	8			0			0.92
2	1.54	0.48	4	4.27	1.73	3	2.38	0.42	5	0.56	1.55	2.78
3	10.24	9.08	4			0	1.84	0.50	8		0.18	
4	1.21	0.35	4			0	3.20	1.78	8		2.64	
Winter	4.05	3.11		3.60	0.68		2.47	0.67		0.69	0.61	0.89

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: POLYCHAETE ABUNDANCE
HABITAT: DEEP

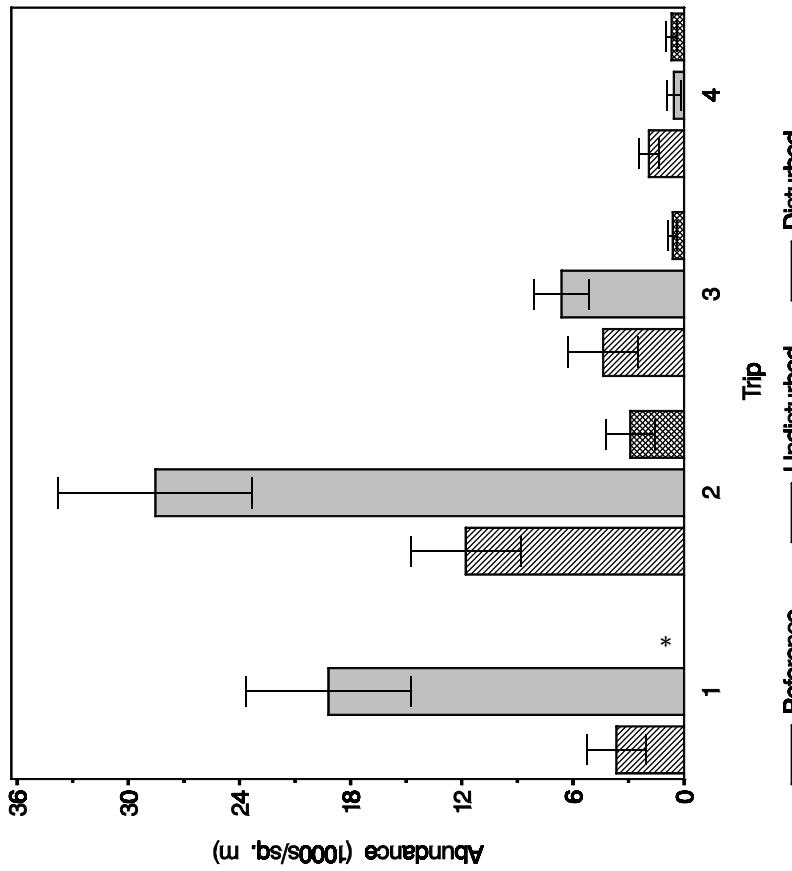


Figure DE-21. Mean and associated standard error of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-22. Mean (\bar{x}_r) and associated standard error (SE) of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_r	SE	N	\bar{x}_r	SE	N	\bar{x}_r	SE	N	R_{du}	R_{dr}	R_{ur}
1	3653.41	1608.63	4	19196.05	4438.26	8			0			5.25
2	11784.11	2962.97	4	28531.85	5232.26	5	2901.52	1339.26	3	0.10	0.25	2.42
3	4369.32	1870.63	4	6613.64	1498.50	5	606.06	243.84	3	0.09	0.14	1.51
4	1897.73	545.81	4	545.46	363.64	2	678.03	320.42	6	1.24	0.36	0.29
Spring	5426.14	2389.31		13721.75	6578.63		1395.20	744.59		0.10	0.26	2.53

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: POLYCHAETE ABUNDANCE
HABITAT: DEEP

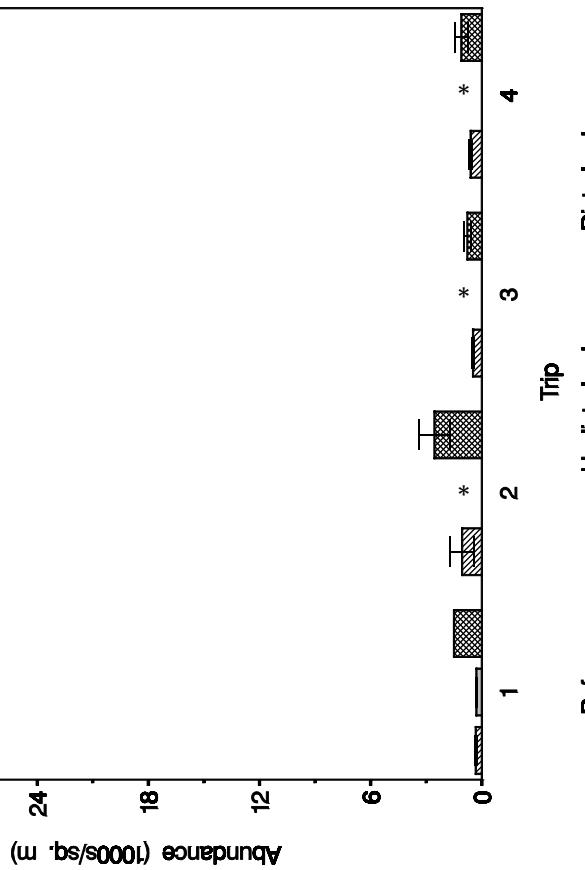


Figure DE-22. Mean and associated standard error of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-23. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	329.55	54.50	4	292.21	31.53	7	1500.00	1	5.13	4.55	0.89	
2	1068.18	630.45	4		0	2556.82	831.46	8		2.39		
3	471.59	69.67	4		0	781.25	192.70	8		1.66		
4	602.27	83.25	4		0	1105.11	350.14	8		1.83		
Summer	617.90	226.70		292.21			1485.80	489.72	5.08	2.40	0.47	

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: POLYCHAETE ABUNDANCE
HABITAT: DEEP

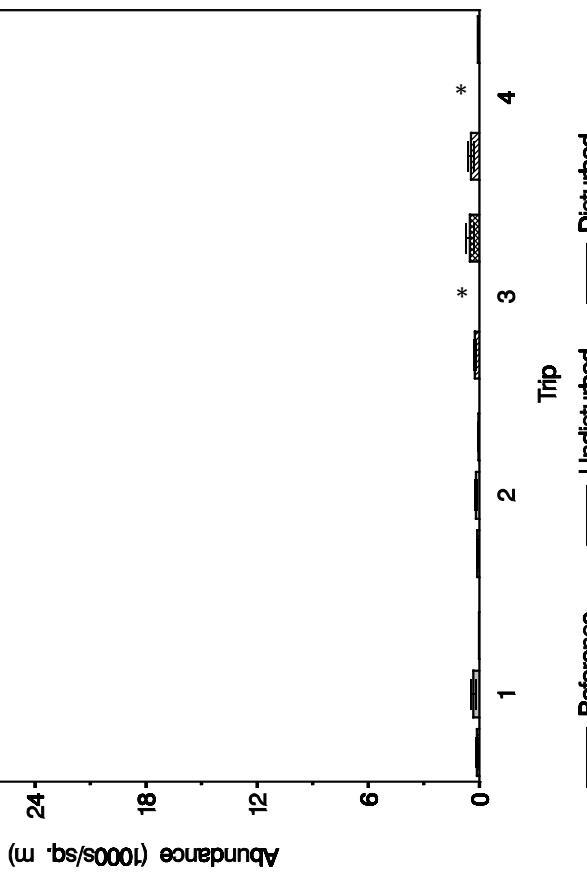


Figure DE-23. Mean and associated standard error of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-24. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	142.05	43.89	4	324.68	130.34	7	22.73		1	0.07	0.16	2.29
2	125.00	21.76	4	187.50	42.90	4	51.14	14.30	4	0.27	0.41	1.50
3	250.00	53.30	4			0	514.21	212.42	8		2.06	
4	454.55	169.82	4			0	85.23	21.80	8		0.19	
Fall	242.90	88.73		256.09	72.27		168.32	138.78		0.66	0.69	1.05

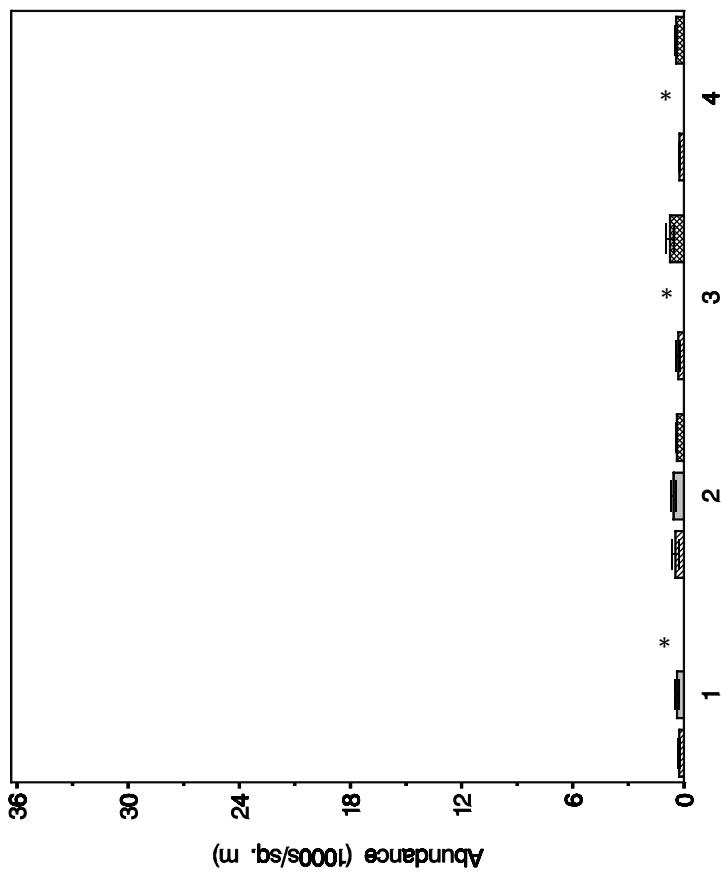


Figure DE-24. Mean and associated standard error of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-25. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	250.00	53.30	4	366.48	107.84	8	381.82	24.27	5	0	0.68	1.47
2	454.55	169.82	4	560.61	126.09	3	750.00	211.33	8	5	0.84	1.23
3	301.14	116.03	4							8		2.49
4	238.64	32.80	4							8		1.71
Winter	311.08	73.21		463.54	88.93		513.64	123.10		1.11		1.65
												1.49

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	DEEP

Figure DE-25. Mean and associated standard error of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

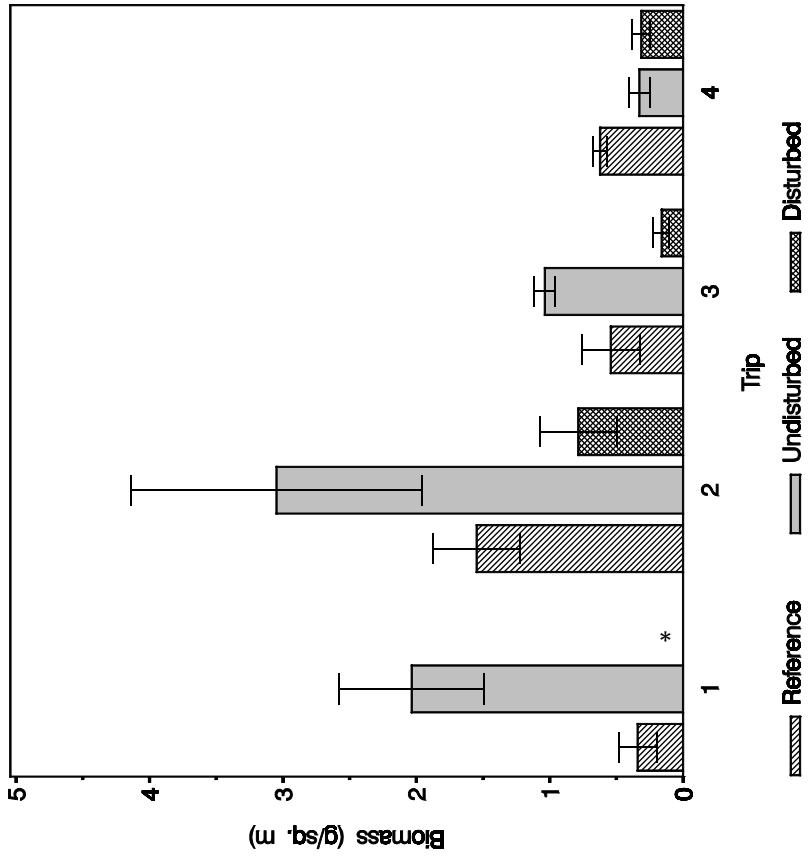


Table DE-26. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.34	0.14	4	2.03	0.54	8			0			5.97
2	1.55	0.33	4	3.05	1.09	5	0.79	0.29	3	0.26	0.51	1.97
3	0.54	0.22	4	1.04	0.08	5	0.16	0.06	3	0.16	0.30	1.91
4	0.62	0.05	4	0.33	0.08	2	0.31	0.07	6	0.96	0.50	0.53
Spring	0.76	0.29		1.61	0.68		0.42	0.18		0.26	0.55	2.11

SITE:	CASWELL BEACH
SEASON:	SUMMER
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	DEEP

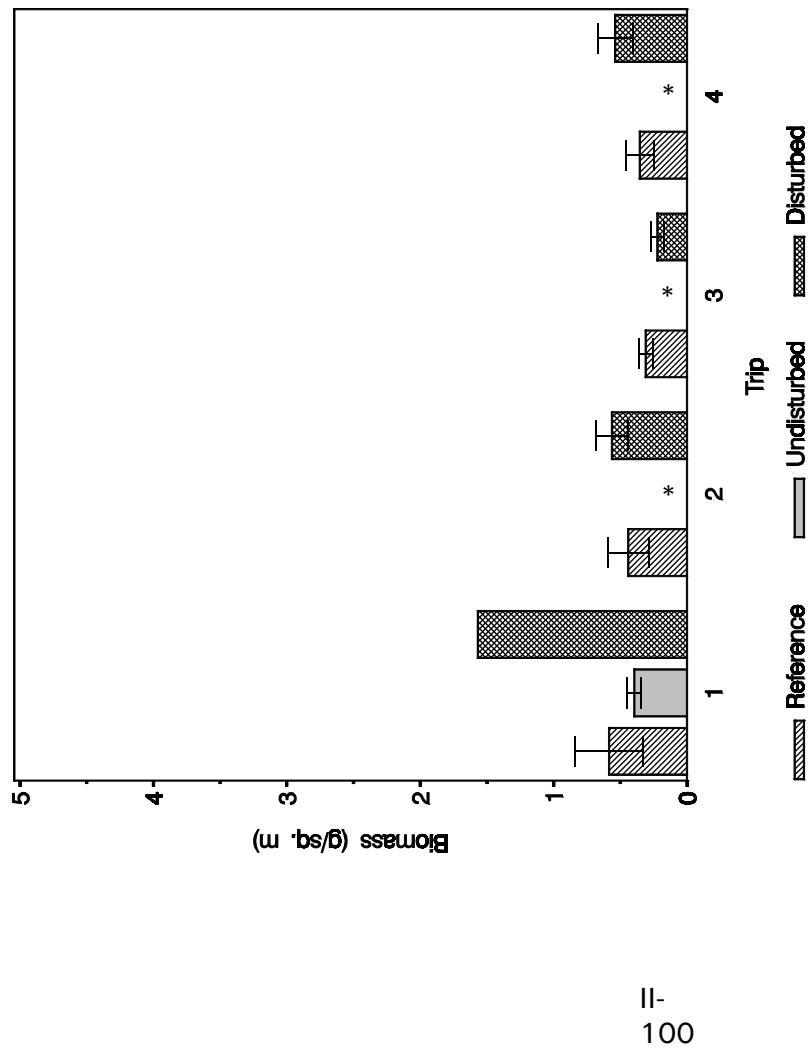


Figure DE-26. Mean and associated standard error of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-27. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.58	0.25	4	0.39	0.05	7	1.57		1	3.97	2.69	0.68
2	0.44	0.15	4				0	0.56	0.12	8		1.28
3	0.31	0.05	4				0	0.22	0.05	8		0.72
4	0.35	0.10	4				0	0.54	0.13	8		1.52
Summer	0.42	0.10		0.39			0.72		0.30	1.83	1.71	0.94

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	DEEP

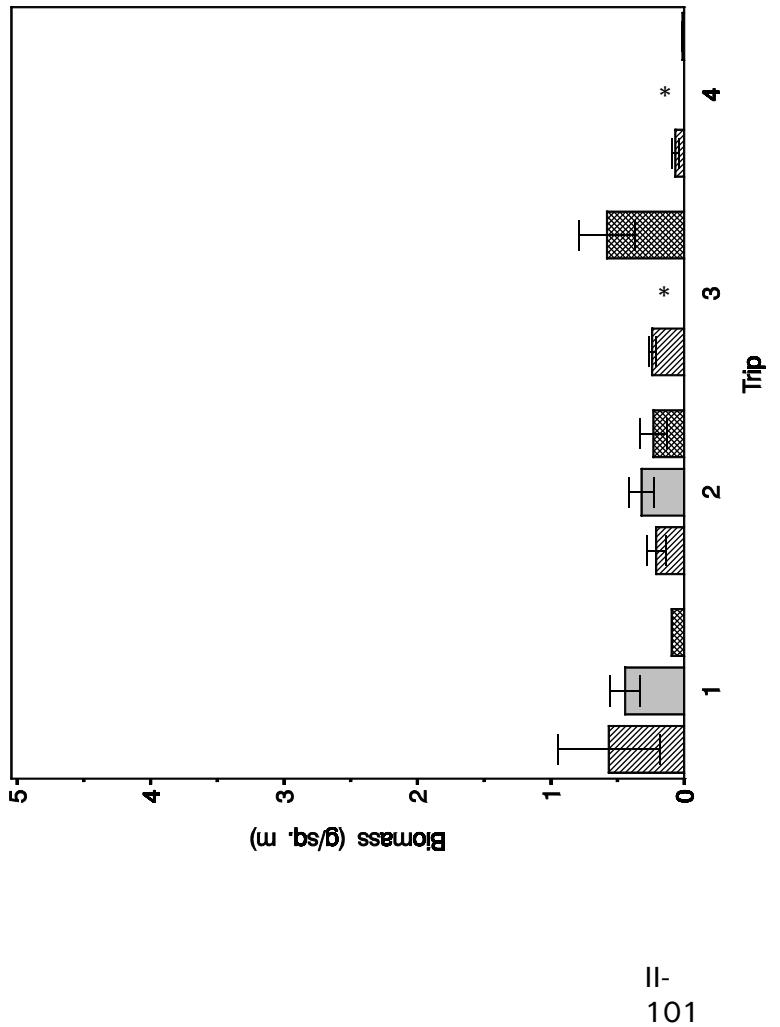


Figure DE-27. Mean and associated standard error of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-28. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.56	0.38	4	0.44	0.11	7	0.09		1	0.21	0.17	0.78
2	0.21	0.07	4	0.32	0.09	4	0.23	0.10	4	0.72	1.10	1.52
3	0.24	0.03	4			0	0.58	0.21	8		2.42	
4	0.07	0.03	4			0	0.01	0.00	8		0.19	
Fall	0.27	0.14		0.38	0.07		0.23	0.15		0.60	0.85	1.41

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	POLYCHAETE BIOMASS
HABITAT:	DEEP

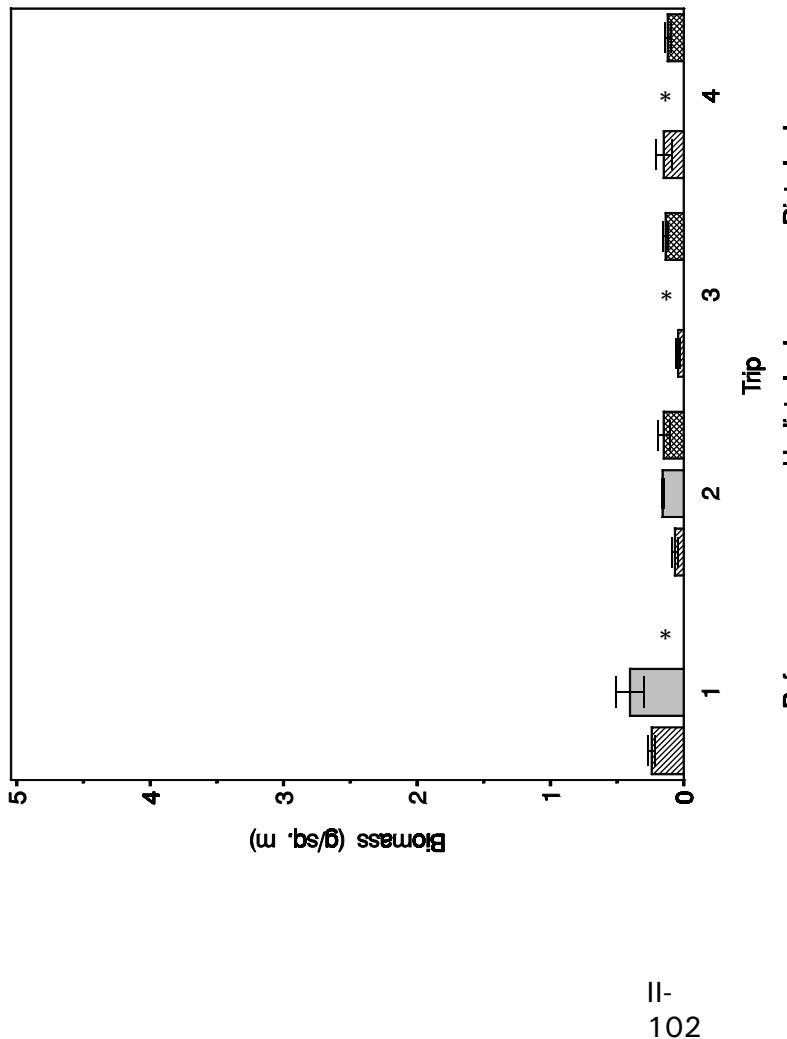


Figure DE-28. Mean and associated standard error of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-29. Mean (\bar{x}_i) and associated standard error (SE) of the total polychaete biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.24	0.03	4	0.40	0.10	8	0.15	0.04	5	0.94	2.28	1.68
2	0.07	0.03	4	0.16	0.00	3	0.14	0.02	8		2.42	
3	0.04	0.01	4		0	0	0.12	0.02	8		3.29	
4	0.15	0.06	4		0	0	0.12	0.02	8		0.80	
Winter	0.12	0.05	10	0.28	0.10	14	0.14	0.02	0.48	1.09	2.26	

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	BIVALVE ABUNDANCE
HABITAT:	DEEP

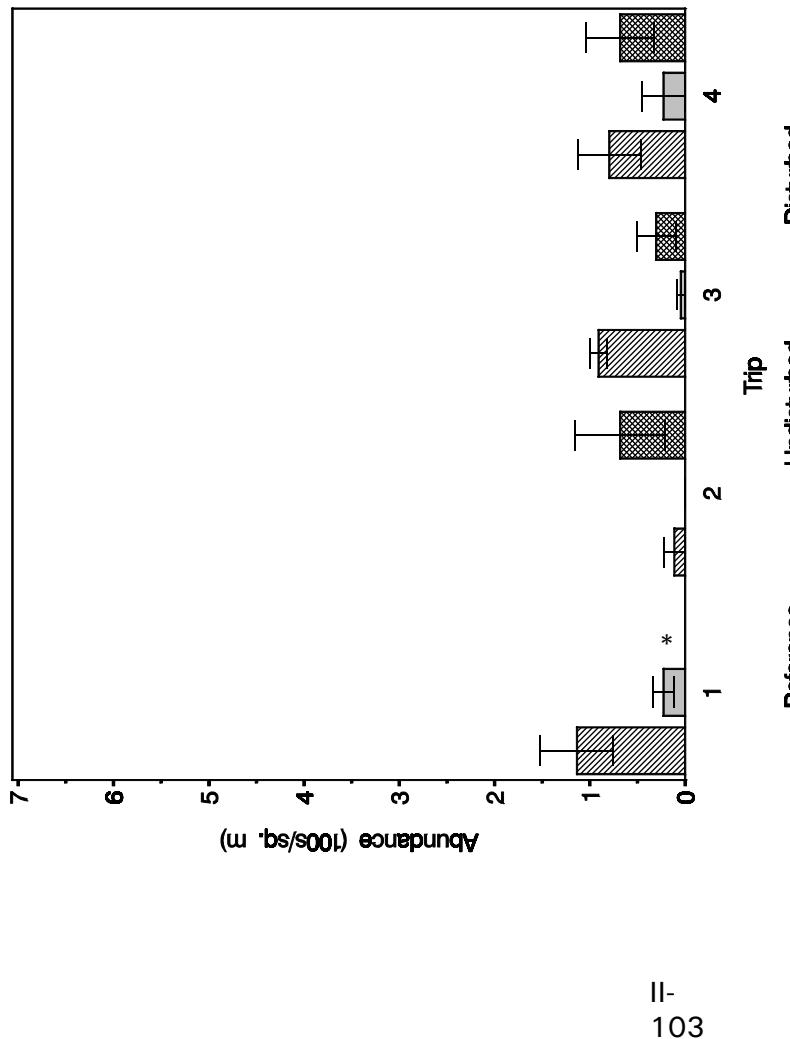


Figure DE-29. Mean and associated standard error of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-30. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	113.64	38.26	4	22.73	11.36	8	0					0.20
2	11.36	11.36	4	0.00	0.00	5	68.18	47.31	3	6.00	6.00	0.00
3	90.91	9.28	4	4.55	4.55	5	30.30	20.04	3	6.67	0.33	0.05
4	79.55	32.80	4	22.73	22.73	2	68.18	35.69	6	3.00	0.86	0.29
Spring	73.86	25.62		12.50	7.93		55.56	21.07		4.44	0.75	0.17

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: BIVALVE ABUNDANCE
HABITAT: DEEP

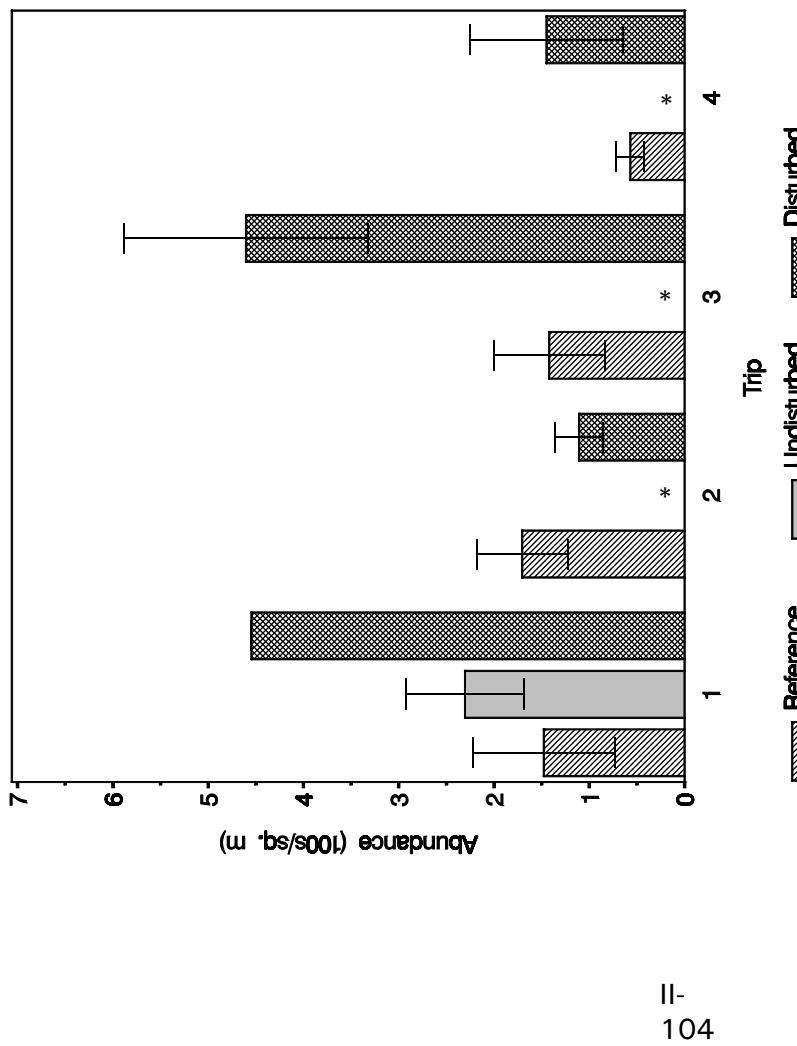


Figure DE-30. Mean and associated standard error of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-31. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	147.73	74.52	4	230.52	62.23	7	454.55		1	1.97	3.08	1.56
2	170.45	47.76	4		0	110.80	25.20	8		0.65		
3	142.05	58.22	4		0	460.23	128.26	8		3.24		
4	56.82	14.67	4		0	144.89	80.46	8		2.55		
Summer	129.26	36.55		230.52			292.61	107.76	1.27	2.26	1.78	

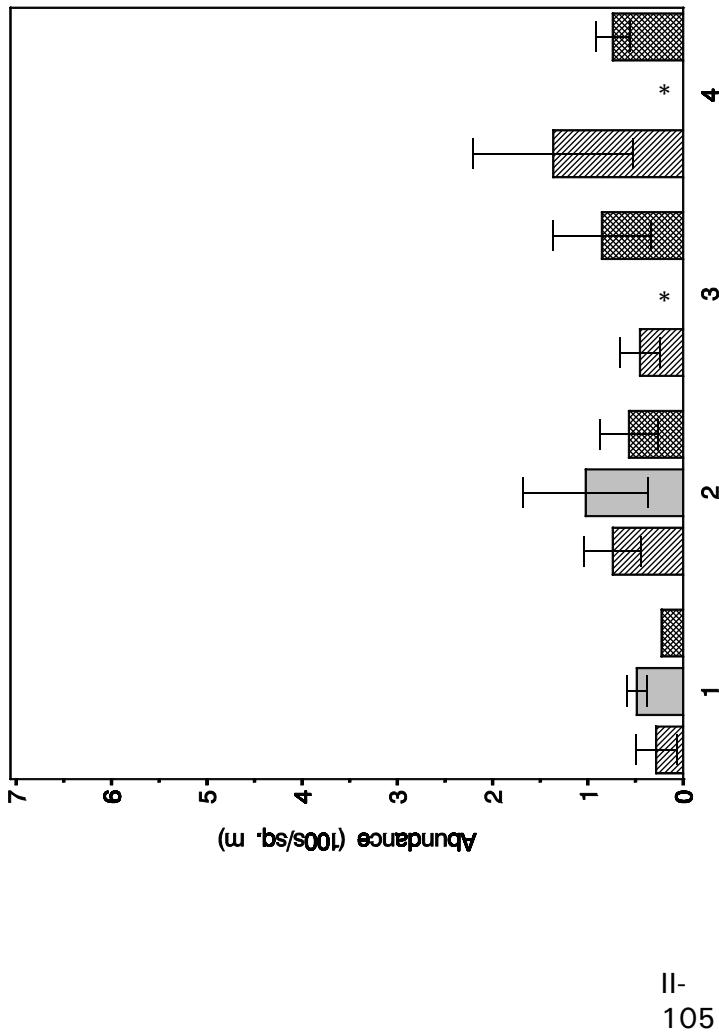


Figure DE-31. Mean and associated standard error of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-32. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	28.41	21.51	4	48.70	10.44	7	22.73	—	1	0.47	0.80	1.71
2	73.86	29.89	4	102.27	65.94	4	56.82	30.07	4	0.56	0.77	1.38
3	45.45	20.75	4	—	—	0	85.23	51.32	8	—	1.88	—
4	136.36	84.02	4	—	—	0	73.86	17.58	8	0.54	—	—
Fall	71.02	33.39	—	75.49	27.77	—	59.66	24.83	7	0.79	0.84	1.06

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	BIVALVE ABUNDANCE
HABITAT:	DEEP

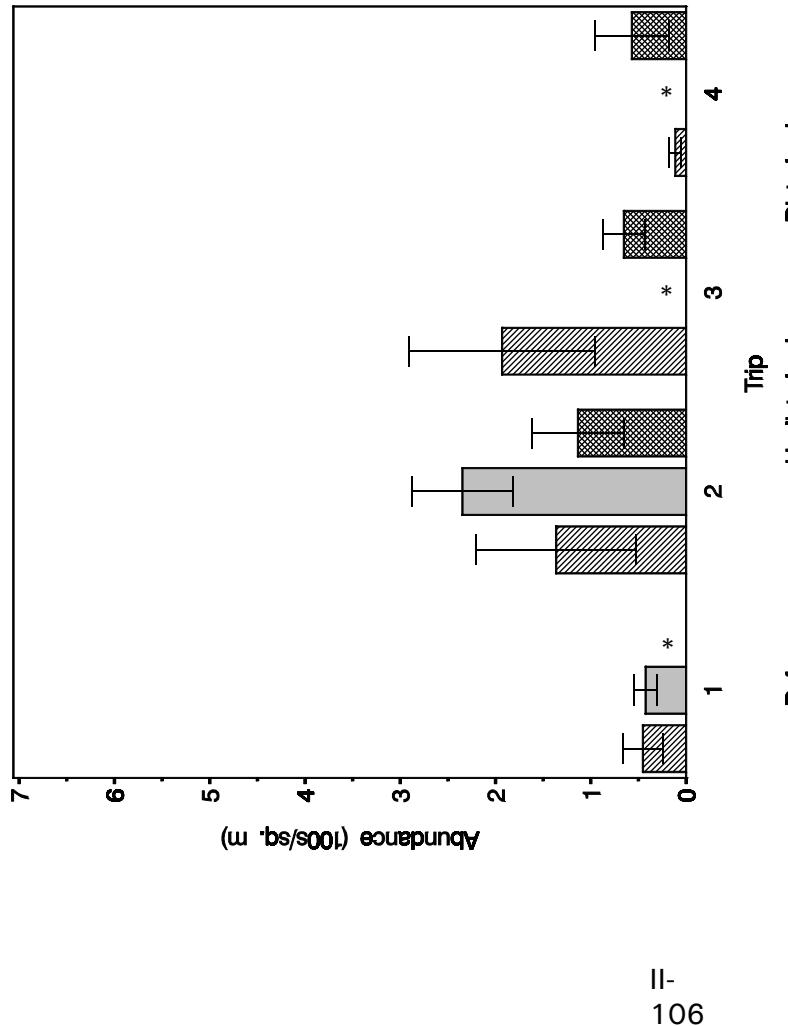


Figure DE-32. Mean and associated standard error of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-33. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve abundance within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	45.45	20.75	4	42.61	11.71	8			0			0.94
2	136.36	84.02	4	234.85	53.03	3	113.64	48.21	5	0.48	0.83	1.72
3	193.18	97.09	4		0	65.34	21.66	8			0.34	
4	11.36	6.56	4		0	56.82	38.89	8			5.00	
Winter	96.59	52.84		138.73	69.54		78.60	23.70	0.57	0.81	1.44	

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	BIVALVE BIOMASS
HABITAT:	DEEP

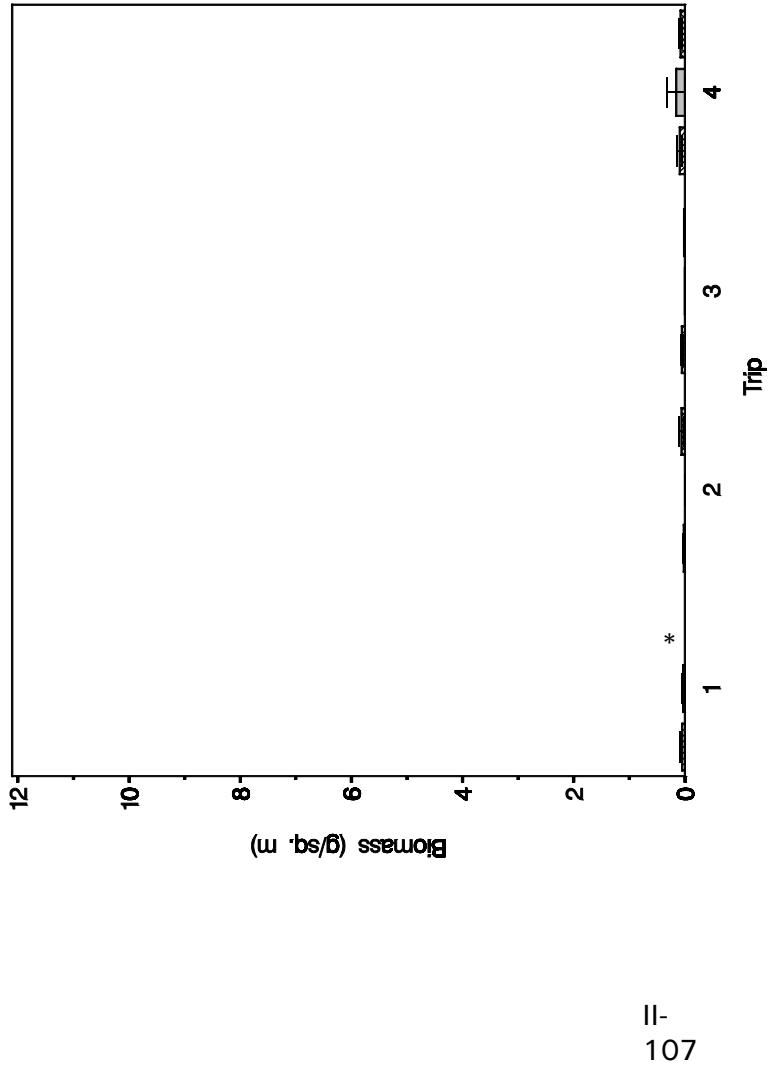


Figure DE-33. Mean and associated standard error of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table DE-34. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.05	0.04	4	0.03	0.03	8			0			0.63
2	0.02	0.02	4	0.00	0.00	5	0.06	0.05	3			3.03
3	0.05	0.02	4	0.00	0.00	5	0.01	0.00	3	15.00	0.26	0.02
4	0.09	0.04	4	0.16	0.16	2	0.08	0.02	6	0.50	0.85	1.69
Spring	0.05	0.02		0.05	0.05		0.05	0.02	1.08	0.95	0.87	

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: BIVALVE BIOMASS
HABITAT: DEEP

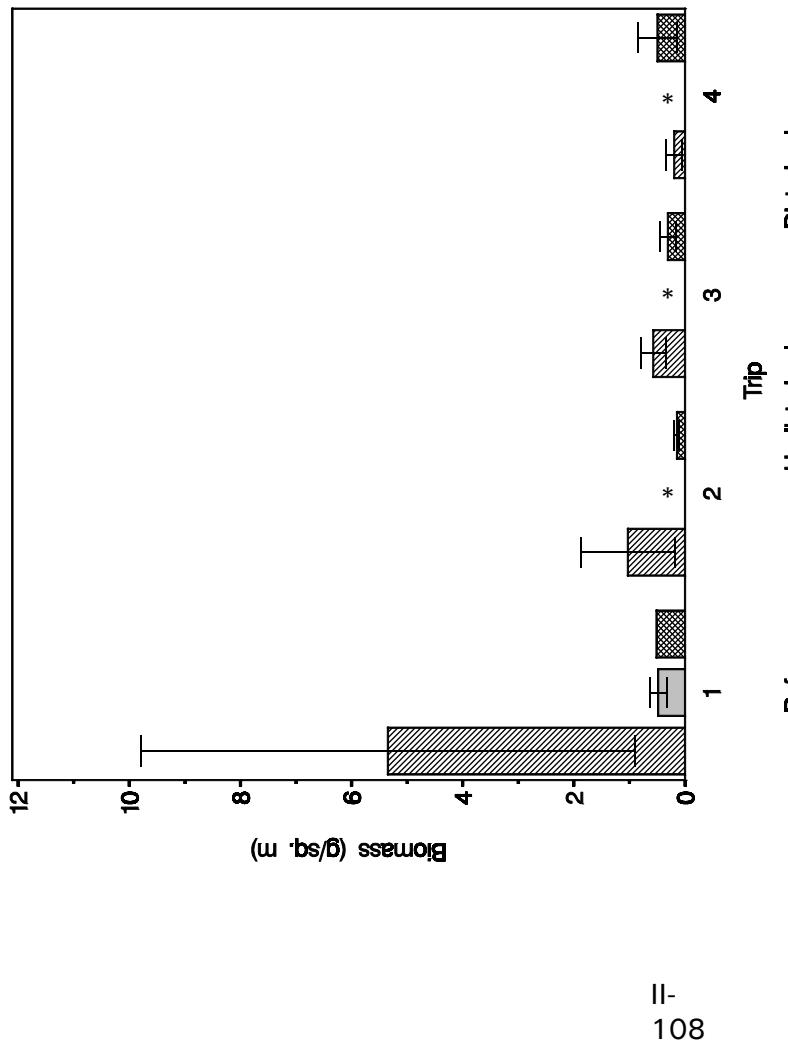


Figure DE-34. Mean and associated standard error of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table DE-35. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	5.35	4.45	4	0.48	0.15	7	0.51		1	1.06	0.10	0.09
2	1.03	0.84	4		0	0.15	0.05	8			0.14	
3	0.57	0.22	4		0	0.31	0.15	8			0.54	
4	0.20	0.14	4		0	0.49	0.35	8			2.53	
Summer	1.79	1.65		0.48			0.37	0.15	0.76	0.20	0.27	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	BIVALVE BIOMASS
HABITAT:	DEEP

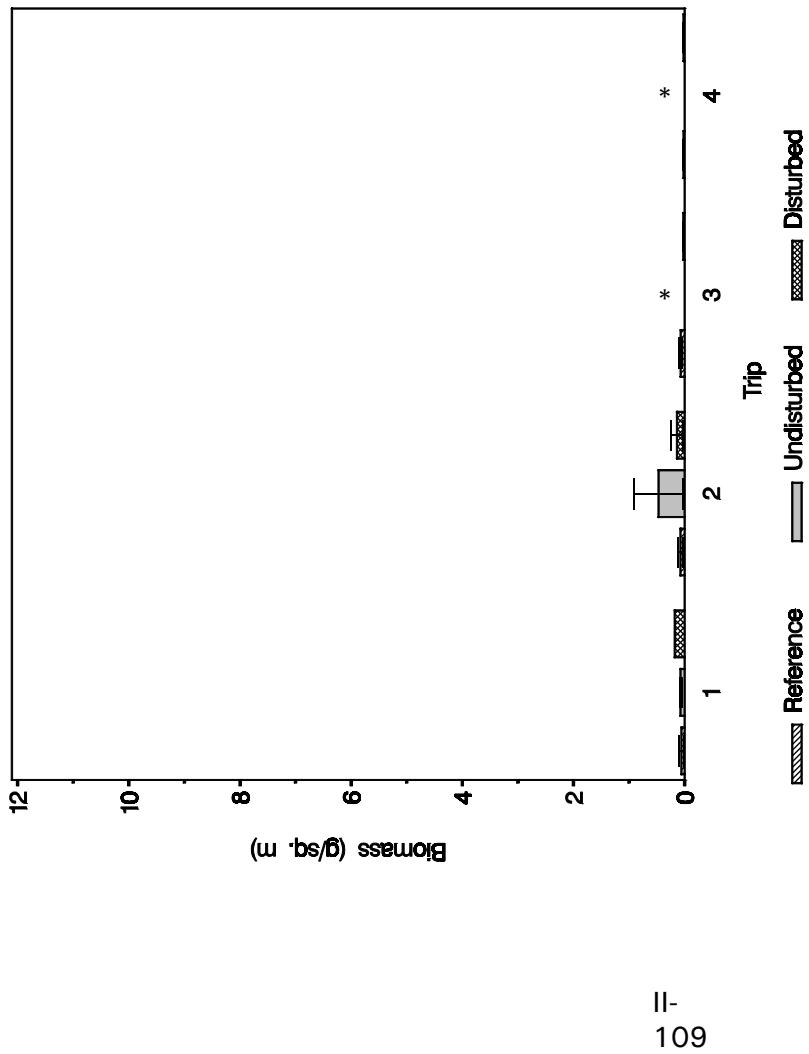


Figure DE-35. Mean and associated standard error of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table DE-36. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.06	0.04	4	0.07	0.02	7	0.18		1	2.43	3.19	1.31
2	0.08	0.04	4	0.47	0.44	4	0.14	0.11	4	0.29	1.84	6.25
3	0.07	0.03	4			0	0.02	0.01	8		0.34	
4	0.02	0.01	4			0	0.02	0.01	8		0.88	
Fall	0.06	0.02		0.27	0.19		0.09	0.05	0.33	1.61	4.84	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	BIVALVE BIOMASS
HABITAT:	DEEP

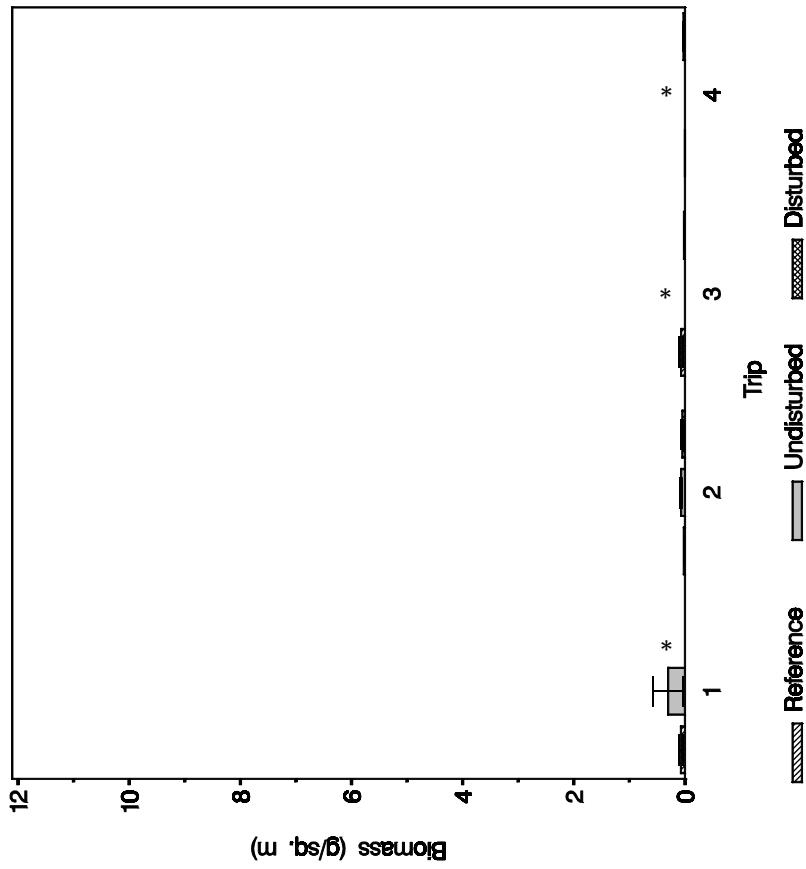


Figure DE-36. Mean and associated standard error of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table DE-37. Mean (\bar{x}_i) and associated standard error (SE) of the total bivalve biomass within the deep habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.07	0.03	4	0.30	0.26	8	-	-	0	-	-	4.24
2	0.02	0.00	4	0.07	0.02	3	0.04	0.03	5	0.66	2.07	3.16
3	0.07	0.03	4	-	-	0	0.02	0.00	8	-	0.27	-
4	0.00	0.00	4	-	-	0	0.03	0.01	8	-	30.83	-
Winter	0.04	0.02	-	0.19	0.14	-	0.03	0.01	-	0.16	0.73	4.56

Table DE-38. Parameter interval estimates (90% confidence level) for differences between categories of stations in the deep habitat. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0. Shaded intervals are statistically significant.

Parameter	Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
		CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Deep Abundance	Spring	-14458.38	7824.00	8224.87	17272.32	5634.78	26496.80
Deep Biomass		-3.07	0.48	0.02	2.30	0.68	4.23
Deep Diversity		-0.12	0.86	-0.59	0.23	-1.18	0.06
Crustacean Abundance		1650.09	8188.27	6442.06	10974.63	1357.70	6220.62
Crustacean Biomass		-3.73	0.86	0.13	3.73	1.05	5.68
Polychaete Abundance		-19844.10	3252.89	-98.42	8160.30	1402.50	23250.60
Polychaete Biomass		-2.06	0.36	-0.22	0.90	0.04	2.35
Bivalve Abundance		17.11	105.62	-36.42	73.04	-80.20	-5.91
Bivalve Biomass		-0.08	0.09	-0.05	0.06	-0.09	0.08
Deep Abundance	Summer			-34.46	4003.21		
Deep Biomass				-4.52	4.97		
Deep Diversity				-0.90	-0.10		
Crustacean Abundance				1068.37	5137.60		
Crustacean Biomass				-7.06	6.28		
Polychaete Abundance				-1758.32	22.52		
Polychaete Biomass				-0.82	0.22		
Bivalve Abundance				-351.11	24.40		
Bivalve Biomass				-1.32	4.16		
Deep Abundance	Fall	830.89	5724.72	2383.19	6301.48	-974.06	3103.12
Deep Biomass		-0.70	0.98	-0.45	1.49	-0.42	1.18
Deep Diversity		-0.56	0.10	-0.38	0.33	-0.23	0.64
Crustacean Abundance		856.73	5676.56	2384.97	6009.93	-1150.80	3012.41
Crustacean Biomass		-0.74	1.29	-0.68	2.02	-0.91	1.69
Polychaete Abundance		-202.01	175.63	-197.21	346.36	-170.40	345.93
Polychaete Biomass		-0.37	0.15	-0.30	0.38	-0.12	0.42
Bivalve Abundance		-76.13	67.20	-57.30	80.03	-45.64	77.30
Bivalve Biomass		-0.53	0.10	-0.12	0.05	-0.15	0.51
Deep Abundance	Winter	-4171.36	420.41	-2947.15	1688.25	-461.52	2953.57
Deep Biomass		-3.23	2.44	-2.36	3.20	-0.77	2.41
Deep Diversity		-0.27	0.08	-0.17	0.20	-0.04	0.27
Crustacean Abundance		-3724.52	473.57	-2572.34	1714.00	-339.13	2731.75
Crustacean Biomass		-4.81	5.70	-3.68	6.82	-0.45	2.70
Polychaete Abundance		-342.53	37.61	-438.89	33.77	-300.68	200.49
Polychaete Biomass		-0.33	0.02	-0.10	0.07	-0.02	0.31
Bivalve Abundance		-186.25	101.97	-77.57	113.55	-61.09	181.36
Bivalve Biomass		-0.38	0.09	-0.03	0.05	-0.08	0.39
Deep Abundance	All	-6839.07	6420.19	1706.74	7516.19	-1371.68	11013.49
Deep Biomass		-2.40	2.60	-2.27	3.43	-1.66	2.63
Deep Diversity		-0.21	0.51	-0.52	0.18	-0.78	0.13
Crustacean Abundance		-814.13	4508.47	1824.04	5965.77	38.84	4056.63
Crustacean Biomass		-3.17	3.83	-3.45	5.34	-2.65	3.87
Polychaete Abundance		-8607.83	4540.04	-1361.04	2878.56	-3520.11	9105.43
Polychaete Biomass		-0.98	0.44	-0.40	0.44	-0.43	1.01
Bivalve Abundance		-117.34	74.09	-143.04	85.20	-126.27	111.67
Bivalve Biomass		-1.14	1.62	-1.02	1.72	-0.15	0.38

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

WRACK HABITAT

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: GHOST CRABS
HABITAT: WRACK

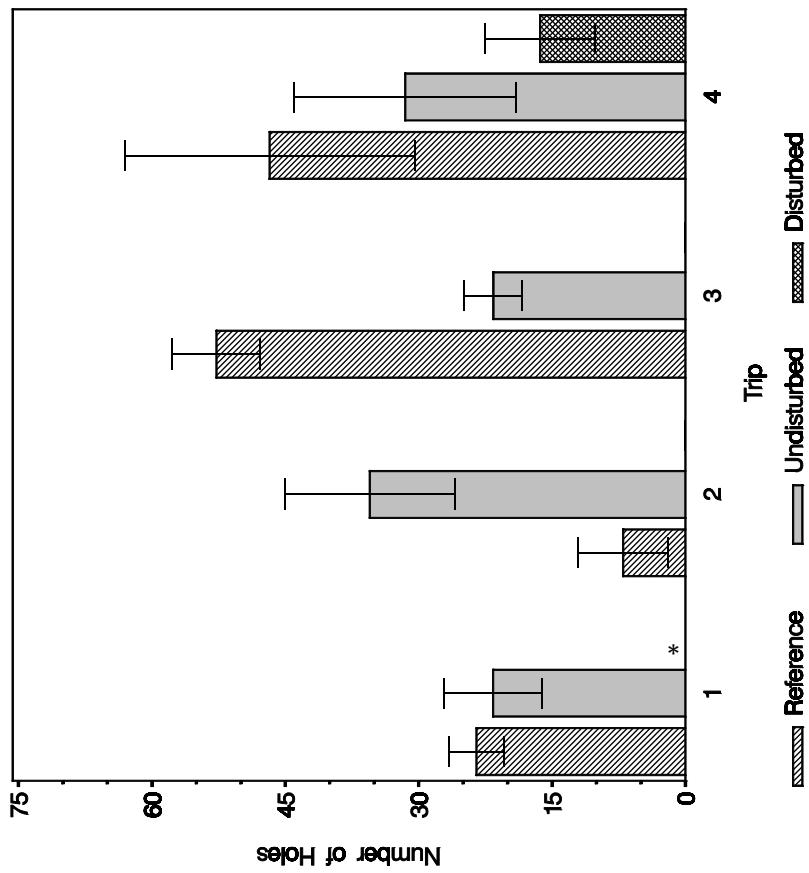


Figure WR-1. Mean and associated standard error of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table WR-1. Mean (\bar{x}_i) and associated standard error (SE) of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	23.50	3.12	4	21.63	5.54	8					0.92
2	7.00	5.07	4	35.50	9.53	6	0.00	0.00	2	0.00	5.07
3	52.75	4.92	4	31.60	3.23	5	0.00	0.00	3	0.00	0.41
4	46.75	16.29	4	31.50	12.50	2	16.33	6.17	6	0.52	0.35
Spring	32.50	11.50		27.56	5.12		5.44	5.24		0.20	0.17
											0.85

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: GHOST CRABS
HABITAT: WRACK

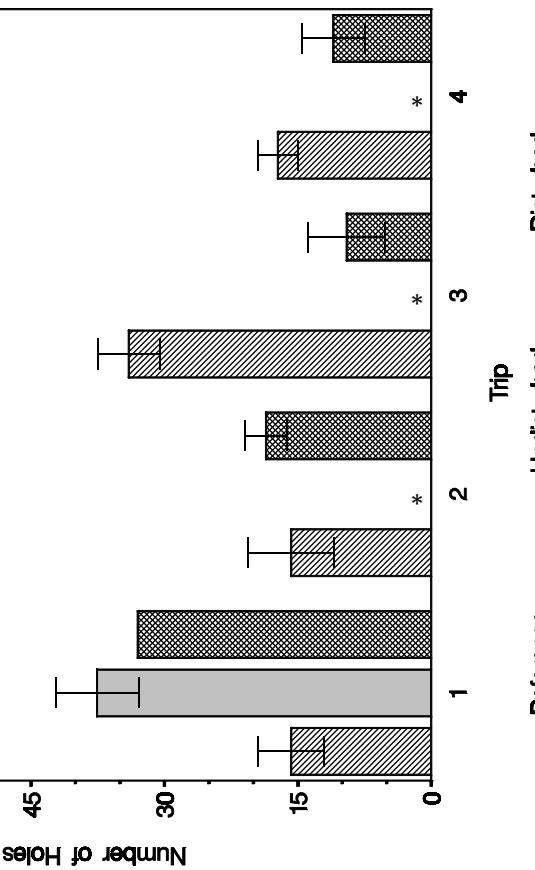


Figure WR-2. Mean and associated standard error of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table WR-2. Mean (\bar{x}_i) and associated standard error (SE) of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed				R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	15.75	3.75	4	37.57	4.66	7	33.00		1	0.88		2.10	2.39		
2	15.75	4.82	4				18.57	2.36	7				1.18		
3	34.00	3.49	4				9.50	4.36	8				0.28		
4	17.25	2.25	4				11.00	3.57	8				0.64		
Summer	20.69	4.82		37.57			18.02	5.74		0.48		0.87	1.82		

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: GHOST CRABS
HABITAT: WRACK

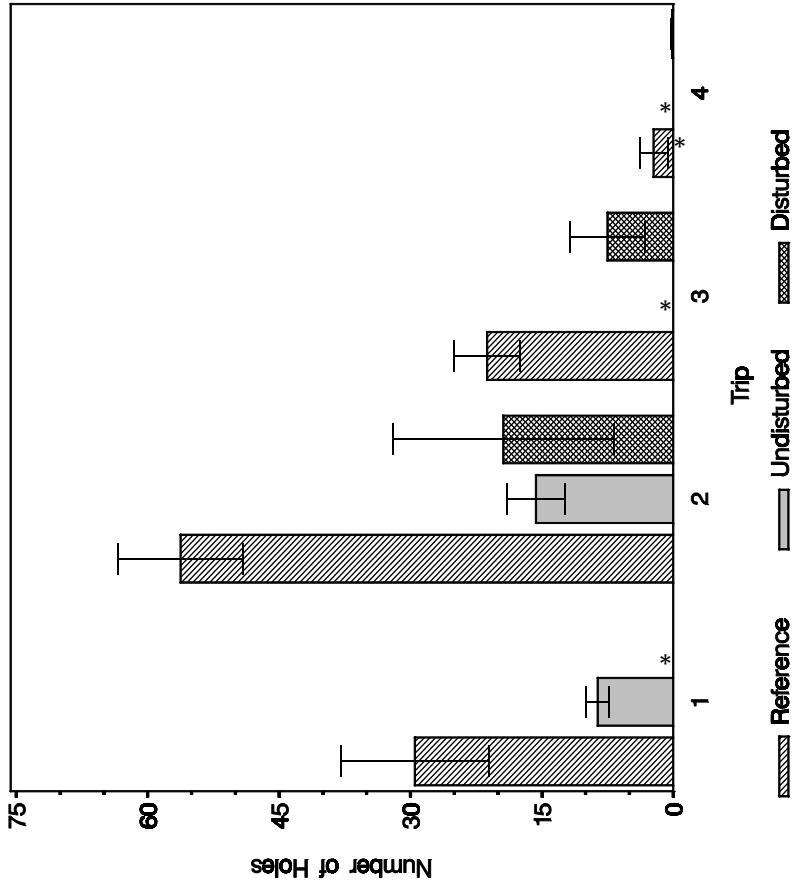


Figure WR-3. Mean and associated standard error of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table WR-3. Mean (\bar{x}_i) and associated standard error (SE) of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{dr}), disturbed and reference stations (R_{ur}), and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed				R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}				
1	29.50	8.45	4	8.63	1.31	8								0.29
2	56.25	7.16	4	15.67	3.28	3	19.40	12.58	5	1.24			0.34	0.28
3	21.25	3.75	4				7.50	4.25	8				0.35	
4	2.25	1.60	4				0.13	0.13	8				0.06	
Fall	27.31	11.59		12.15	2.69		9.01	5.90		0.74	0.33		0.44	

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: GHOST CRABS
HABITAT: WRACK

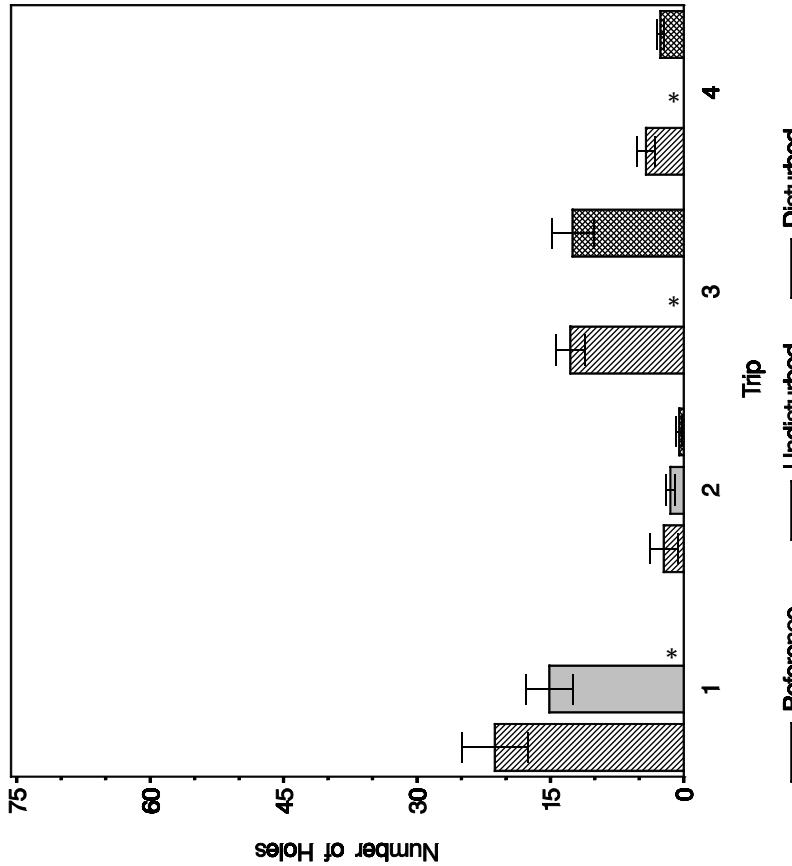


Figure WR-4. Mean and associated standard error of the total Ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table WR-4. Mean (\bar{x}_i) and associated standard error (SE) of the total ghost crab holes within the wrack habitat at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	21.25	3.75	4	15.13	2.66	8						0.71
2	2.25	1.60	4	1.50	0.50	2	0.50	0.34	6	0.33	0.22	0.67
3	12.75	1.65	4				12.50	2.35	8		0.98	
4	4.25	1.03	4				2.63	0.42	8		0.62	
Winter	10.13	4.50		8.31	4.96		5.21	3.28		0.63	0.51	0.82

Table WR-5. Ghost crab hole abundance interval estimates (90% confidence level) for differences between categories in the wrack habitat. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0. Shaded intervals are statistically significant.

Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Spring	-15.83	25.72	6.20	47.91	10.03	34.19
Summer			-9.70	15.04		
Fall	-4.46	34.80	-3.15	39.76	-7.56	13.84
Winter	-9.24	12.86	-4.27	14.10	-6.71	12.92
All	-14.98	17.50	-3.59	30.06	0.80	23.15

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

SEINE HABITAT

Table SE-1. Seine species list and total percent composition

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
<i>Alosa aestivalis</i>	Blueback herring	0.01	0.06										
<i>Alosa mediocris</i>	Hickory shad	0.01	0.12										
<i>Alosa sapidissima</i>	American shad	0.81	1.08	2.23	0.53	0.46							
<i>Anchoa hepsetus</i>	Striped anchovy	59.16	92.83	0.03	0.53	1.37							
<i>Anchoa mitchilli</i>	Bay anchovy			4.84	0.53	13.24							
<i>Arenaeus cibarius</i>	Speckled swimming crab			0.07		0.23							
<i>Astroscopus guttatus</i>	Northern stargazer	0.48		0.03	0.69	0.23							
<i>Bairdiella chrysoura</i>	Silver perch			0.35	0.41								
<i>Bivalvia</i>	Clams	0.24		0.10	0.10								
<i>Brevoortia tyrannus</i>	Atlantic menhaden			0.10	0.10								
<i>Callinectes sapidus</i>	Blue crab			0.10	0.10								
<i>Callinectes similis</i>	Lesser blue crab	0.03		0.10	0.10								
<i>Caranx hippos</i>	Crevalle jack			0.10	0.10								
<i>Cephalopoda</i>	Squids	0.16		0.10	0.10								
<i>Chilomycterus schoepfi</i>	Striped burrfish			32.40	0.53	0.68							
<i>Chloroscombrus chrysurus</i>	Atlantic bumper	0.01											
<i>Clupea harengus harengus</i>	Atlantic herring												
<i>Crangon septemspinosa</i>	Sand shrimp												
<i>Cynoscion nebulosus</i>	Spotted seatrout				0.03	0.03							
<i>Dasyatis americana</i>	Southern stingray				2.23	2.23							
<i>Dasyatis sabina</i>	Atlantic stingray				0.14	0.14							
<i>Dasyatis say</i>	Bluntnose stingray				0.75	0.75							
Echinoidea	Heart urchins												
<i>Elops saurus</i>	Ladyfish												
<i>Fundulus majalis</i>	Striped killifish	0.23											
<i>Gymnura micrura</i>	Smooth butterfly ray				0.21	0.21							
<i>Lagodon rhomboides</i>	Pinfish				0.07	0.07							
<i>Larimus fasciatus</i>	Banded drum				0.03	0.03							
<i>Lestostomus xanthurus</i>	Spot	1.07	0.84	0.75	0.53	0.53							
<i>Libinia dubia</i>	Longnose spider crab				0.17	0.17							
<i>Membra martinica</i>	Rough silverside	31.62	0.73	0.03	0.23	0.23							
<i>Menidia menidia</i>	Atlantic silverside	4.43	0.44	0.03	0.68	0.68							
<i>Menticirrhus americanus</i>	Southern kingfish				0.91	0.91							
<i>Menticirrhus littoralis</i>	Gulf kingfish	0.13		13.11	47.95	47.95							
<i>Menticirrhus saxatilis</i>	Northern kingfish	0.16	0.12	0.03	0.03	0.03							
<i>Nicotropogonias undulatus</i>	Atlantic croaker	0.03	0.32	0.07	0.10	0.03							
<i>Monacanthus hispidus</i>	Planehead filefish	0.10	0.03		0.07	0.29							
<i>Mugil cephalus</i>	Striped mullet	0.07		0.51	2.97	4.35							

Table SE-1. (Continued)

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
<i>Mugil curema</i>	White mullet				2.85	1.06	6.85	5.80	24.71				
<i>Opisthonema oglinum</i>	Atlantic thread herring				0.03	11.46							
<i>Orthopristis chrysoptera</i>	Pigfish				0.03	0.03							
<i>Ovalipes ocellatus</i>	Lady crab	0.87	0.23	0.79				0.46					
<i>Ovalipes stephensoni</i>	Coarsehand lady crab	0.03											
<i>Paguridae</i>	Right-handed hermit crabs	0.03			0.07								
<i>Paralichthys dentatus</i>	Summer flounder				0.14								
<i>Paralichthys lethostigma</i>	Southern flounder	0.01			0.03								
<i>Peprilus triacanthus</i>	Butterfish												
<i>Persephona mediterranea</i>	Mottled purse crab												
<i>Pogonias cromis</i>	Black drum												
<i>Pomatomus saltatrix</i>	Bluefish												
<i>Portunus sayi</i>	Sargassum swimming crab												
<i>Prionotus carolinus</i>	Northern searobin												
<i>Sciaenops ocellatus</i>	Red drum												
<i>Scomberomorus maculatus</i>	Spanish mackerel												
<i>Scophthalmus aquosus</i>	Windowpane												
<i>Selene vomer</i>	Lookdown												
<i>Sphaeroides maculatus</i>	Northern puffer	0.05	0.20										
<i>Stomatopoda</i>	Mantis shrimp	0.01											
<i>Strongylura marina</i>	Atlantic needlefish	0.04											
<i>Syngnathus fuscus</i>	Northern pipefish												
<i>Trachinotus carolinus</i>	Florida pompano	0.42	2.04	0.03	2.37			0.23					
<i>Trachinotus falcatus</i>	Permit												
<i>Trinectes maculatus</i>	Hogchoker												
Total		100	100	100	100	100	100	100	100	100	100	100	100

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Nekton Abundance
HABITAT:	Seine

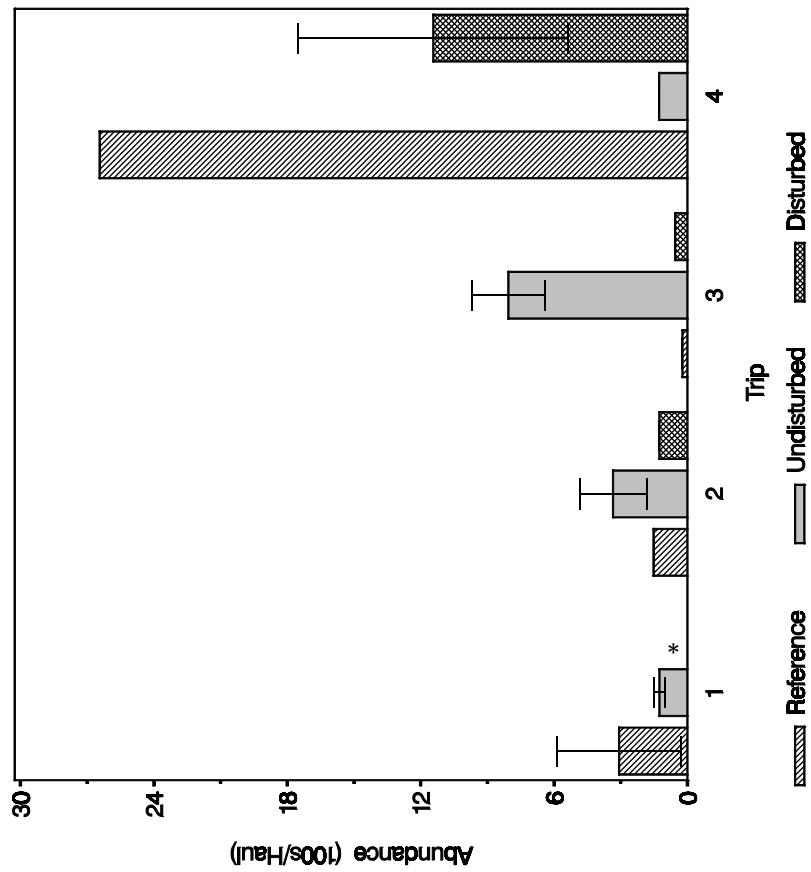


Figure SE-1. Mean and associated standard error of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table SE-2. Mean (\bar{x}_i) and associated standard error (SE) of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	307.50	278.50	2	125.50	25.29	4			0			0.41
2	152.00		1	334.67	150.80	3	126.00		1	0.38	0.83	2.20
3	22.00		1	805.33	163.85	3	55.00		1	0.07	2.50	36.61
4	2644.00		1	127.00		1	1143.00	607.93	3	9.00	0.43	0.05
Spring	781.38	648.01		348.13	173.85		441.33	508.86		1.27	0.56	0.45

30
2418
12
6

Abundance (100s/Haul)

Figure SE-2. Mean and associated standard error of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

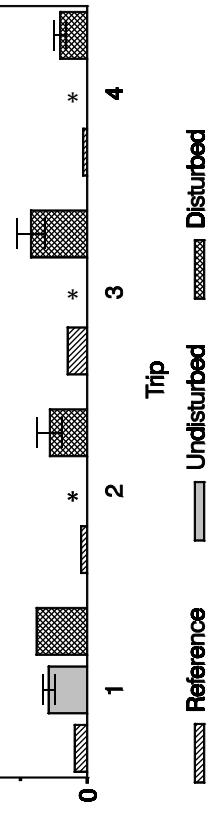


Table SE-3. Mean (\bar{x}_i) and associated standard error (SE) of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	56.00		1	173.33	26.44	3	227.00		1	1.31	4.05	3.10
2	27.00		1				167.75		4		6.21	
3	88.00		1				252.50		4		2.87	
4	18.00		1				121.50		4		6.75	
Summer	47.25			173.33			192.19		1.11	4.07	3.67	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	NEKTON ABUNDANCE
HABITAT:	SEINE

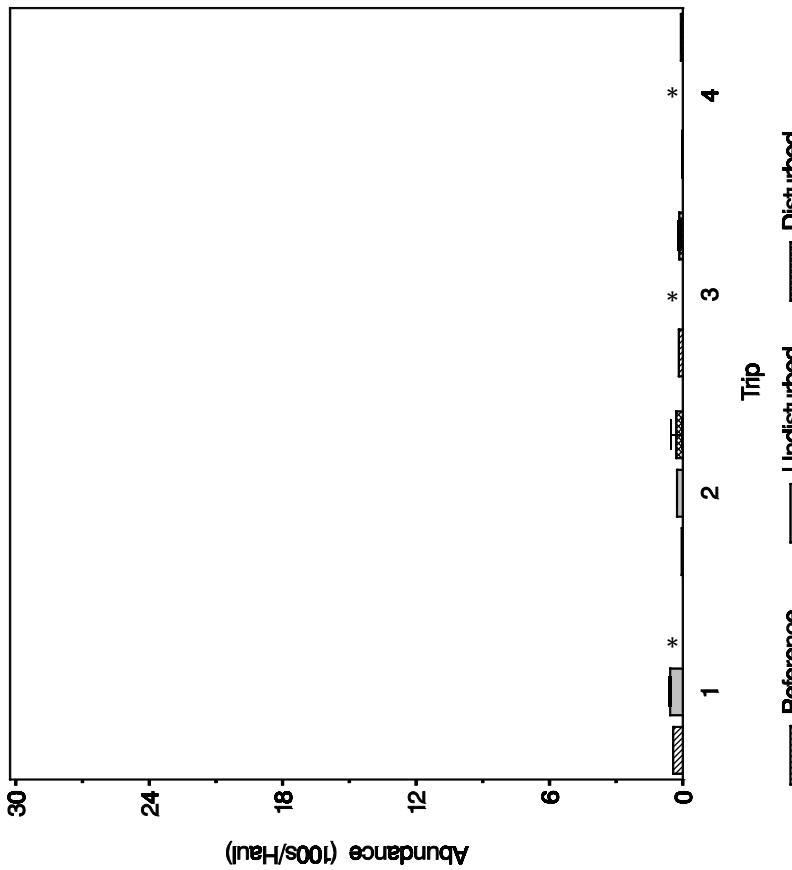


Figure SE-3. Mean and associated standard error of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SE-4. Mean (\bar{x}_i) and associated standard error (SE) of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed		
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N
1	43.00		1	56.50	4.37	4			
2	5.00		1	26.00		1	29.67	25.69	3
3	18.00		1			0	15.75	6.73	4
4	3.00		1			0	8.50	1.85	4
Fall	17.25			41.25	11.13		17.97	8.85	
							0.44	1.04	2.39

Abundance (100s/Haul)

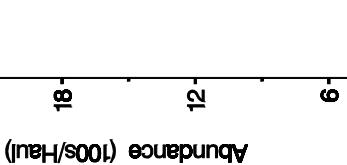


Figure SE-4. Mean and associated standard error of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SE-5. Mean (\bar{x}_i) and associated standard error (SE) of the total nekton abundance caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	18.00		1	10.50	3.97	4			0			0.58
2	3.00		1	4.00	1.00	2	4.00		3.00	2	1.00	1.33
3	13.00		1			0	1.00		0.41	4		0.08
4	17.00		1			0	5.75		2.50	4		0.34
Winter	12.75			7.25	2.83		3.58		1.59		0.49	0.28
												0.57

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	NEKTON DIVERSITY
HABITAT:	SEINE

Figure SE-5. Mean and associated standard error of the nekton diversity caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

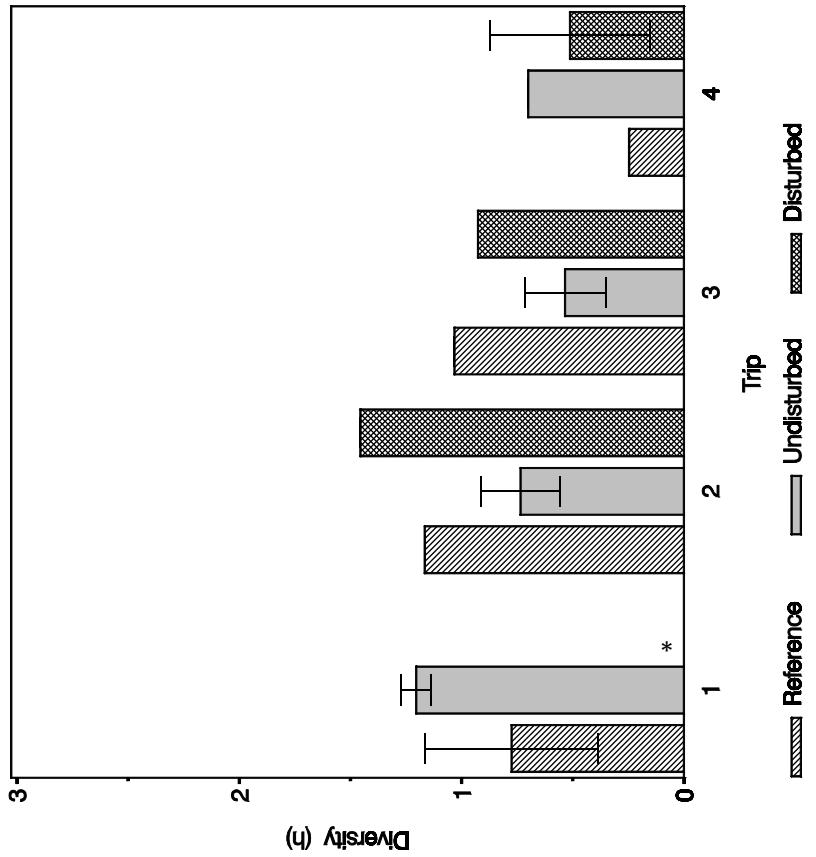


Table SE-6. Mean (\bar{x}_i) and associated standard error (SE) of the nekton diversity caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), and disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.77	0.39	2	1.20	0.07	4			0			1.56
2	1.17		1	0.73	0.18	3	1.46		1	1.98	1.25	0.63
3	1.03		1	0.53	0.18	3	0.93		1	1.73	0.90	0.52
4	0.25		1	0.70		1	0.51	0.36	3	0.73	2.08	2.84
Spring	0.80	0.32		0.79	0.16		0.96	0.34	1.22	1.20	0.99	

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: NEKTON DIVERSITY
HABITAT: SEINE

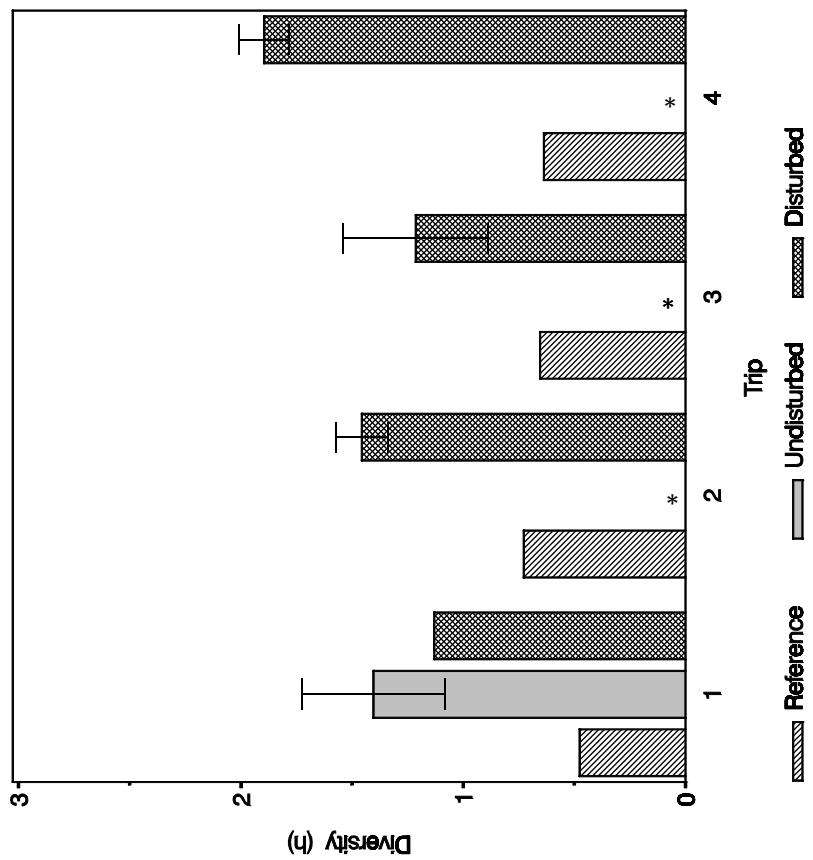


Figure SE-6. Mean and associated standard error of the nekton diversity caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category

Table SE-7. Mean (\bar{x}_i) and associated standard error (SE) of the nekton diversity caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), and disturbed and reference stations (R_{dr}), and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.48		1	1.40	0.32	3	1.13		1	0.80	2.37	2.95
2	0.73		1		0		1.46	0.12	4		2.00	
3	0.65		1		0		1.21	0.33	4		1.86	
4	0.64		1		0		1.90	0.11	4		2.98	
Summer	0.62			1.40			1.42	0.21	1.01	2.28	2.25	

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	NEKTON DIVERSITY
HABITAT:	SEINE

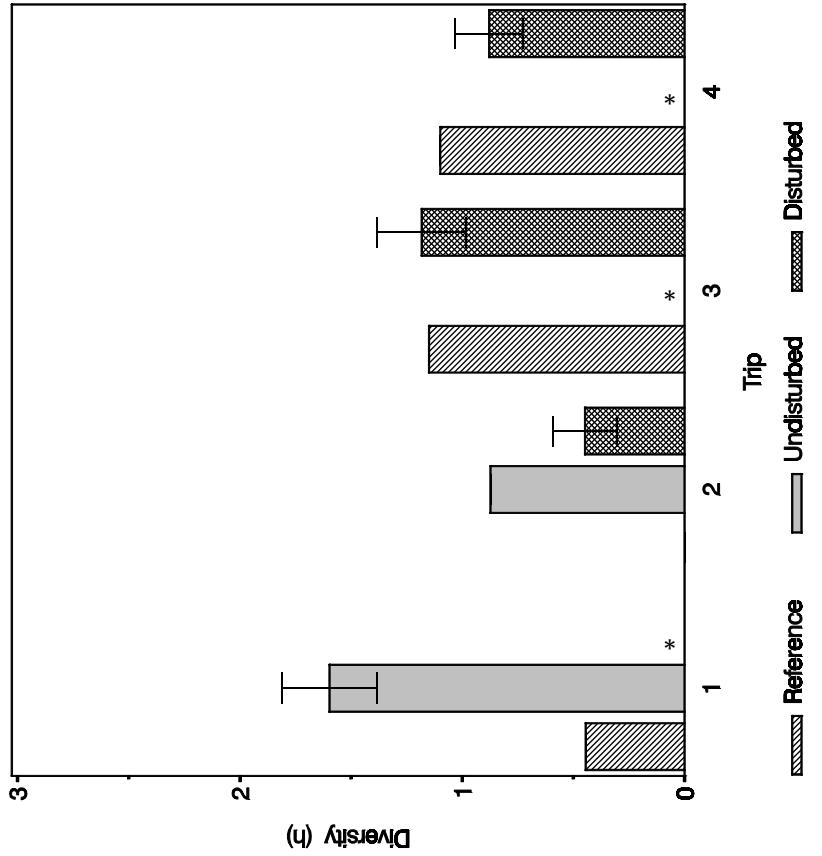


Figure SE-7. Mean and associated standard error of the nekton diversity caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table SE-8. Mean (\bar{x}_i) and associated standard error (SE) of the nekton diversity caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.44		1	1.60	0.21	4			0			3.59
2	0.00		1	0.87		1	0.45	0.14	3	0.51		
3	1.15		1			0	1.18	0.20	4		1.03	
4	1.10		1			0	0.88	0.15	4		0.80	
Fall	0.67			1.23	0.29		0.84	0.20	0.68	1.24	1.83	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	NEKTON DIVERSITY
HABITAT:	SEINE

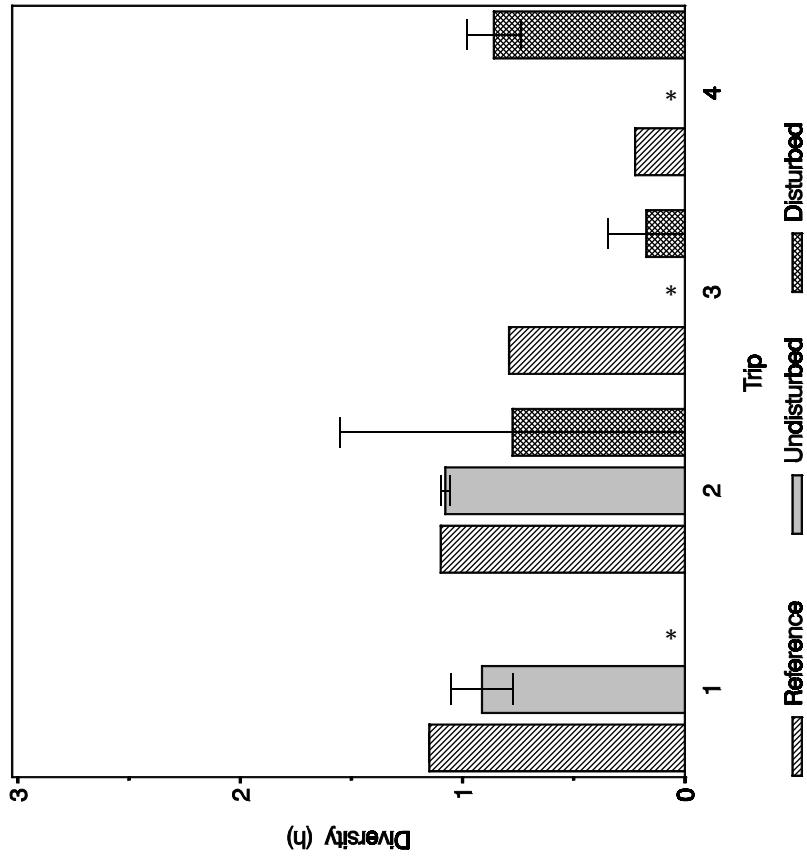


Figure SE-8. Mean and associated standard error of the nekton diversity caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table SE-9. Mean (\bar{x}_i) and associated standard error (SE) of the nekton diversity caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	1.15		1	0.91	0.14	4			0			0.79
2	1.10		1	1.08	0.02	2	0.77	0.77	2	0.72	0.71	0.98
3	0.79		1			0	0.17	0.17	4		0.22	
4	0.22		1			0	0.86	0.12	4		3.84	
Winter	0.82		0.99	0.08		0.60	0.26	0.61	0.74	1.22		

Table SE-10. Nekton parameter interval estimates (90% confidence level) for differences between categories of seine stations. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0.

Parameters	Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
		CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Abundance	Spring	-673.78	1540.28	-1019.44	1699.52	-980.48	794.07
Diversity		-0.58	0.60	-0.93	0.61	-0.79	0.45
Abundance	Summer						
Diversity							
Abundance	Fall					-0.19	46.74
Diversity						-0.19	0.98
Abundance	Winter					-1.69	9.02
Diversity						-0.06	0.85
Abundance	All	-1009.85	1154.19	-1098.32	1200.09	-474.05	431.49
Diversity		-1.00	0.24	-0.91	0.45	-0.39	0.69

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

TRAWL HABITAT

Table TR-1. Trawl species list and total percent composition

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
<i>Alosa aestivalis</i>	Blueback herring												
<i>Alosa sapidissima</i>	American shad	0.65	7.74	3.57	48.88	0.03	11.24	0.37	0.19	0.19	0.19	0.19	0.19
<i>Anchoa hepsetus</i>	Striped anchovy	38.98	42.65	63.31	22.96	64.68	32.24	43.69	5.72	5.72	42.09	42.09	42.09
<i>Anchoa mitchilli</i>	Bay anchovy	0.02											
<i>Archosargus probatocephalus</i>	Sheepshead												
<i>Arenaeus cibarius</i>	Speckled swimming crab												
Astrocoidea	Starfishes												
<i>Astroscopus guttatus</i>	Northern stargazer	0.02											
<i>Astroscopus y-graecum</i>	Southern stargazer	0.19	0.21	0.02	<0.01	0.19	0.13	0.13	0.16	0.16	0.16	0.16	0.16
<i>Bairdiella chrysoura</i>	Silver perch	0.02	0.14	0.01	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
Bivalvia	Clams												
<i>Brevoortia tyrannus</i>	Atlantic menhaden	0.40	0.14	0.01	0.05	0.05	0.05	0.04	0.22	0.22	0.22	0.22	0.22
<i>Busycotypus canaliculatus</i>	Channeled whelk												
<i>Callinectes sapidus</i>	Blue crab												
<i>Cancer irroratus</i>	Lesser blue crab	0.70	1.19	0.26	0.35	0.03	0.19	0.18	0.37	0.37	0.37	0.37	0.37
<i>Centropagis striata</i>	Atlantic rock crab												
<i>Cephalopoda</i>	Black sea bass												
<i>Callionymidae</i>	Squids	2.36	1.94	<0.01	5.00	7.29	1.19	18.99	1.08	3.50	3.50	3.50	3.50
<i>Chaetodipterus faber</i>	Atlantic spadefish												
<i>Chasmodes bosquianus</i>	Striped blenny												
<i>Chiomysterus schoepfi</i>	Striped burrfish	0.02											
<i>Chloroscombrus chrysurus</i>	Atlantic bumper												
<i>Citharichthys spilopterus</i>	Bay whiff	0.16											
<i>Crangon septemspinosa</i>	Sand shrimp	0.91											
<i>Cynoscion regalis</i>	Weakfish	0.03	0.08	2.48	1.45	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
<i>Dasyatis americana</i>	Southern stingray	0.07	<0.01	<0.01	0.01	0.10	0.10	0.10	0.05	0.05	0.05	0.05	0.05
<i>Dasyatis sabina</i>	Atlantic stingray	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Echinoidea	Bluntnose stingray												
<i>Heart urchins</i>	Heart urchins	9.92	2.33	0.14	0.58	0.14	0.48	0.48	0.08	0.08	0.08	0.08	0.08
<i>Etropus microstomus</i>	Smallmouth flounder												
<i>Gymnura altavela</i>	Spiny butterfly ray	0.01	0.23	0.12	0.05	0.05	0.82	0.46	0.07	0.07	0.07	0.07	0.07
<i>Gymnura micrura</i>	Smooth butterfly ray	0.32	0.14	<0.01	0.01	0.02	5.91	13.99	3.55	3.55	3.55	3.55	3.55
<i>Hepatus epheliticus</i>	Calico box crab	0.09	0.14				1.01	0.42	0.34	0.34	0.34	0.34	0.34
<i>Lagodon rhomboides</i>	Pinfish	0.39											
<i>Larimus fasciatus</i>	Banded drum	0.35											
<i>Leiostomus xanthurus</i>	Spot	1.03	1.42	0.06	0.09	0.09	1.55	1.90	3.92	2.74	2.74	2.74	2.74
<i>Libinia dubia</i>	Longnose spider crab		2.35	0.34	0.16	0.16	0.10	0.63	0.01	0.97	0.97	0.97	0.97
<i>Limulus polyphemus</i>	Portly spider crab	0.62	0.06										
<i>Limulus polyphemus</i>	Horseshoe crab												

Table TR-1. (Continued)

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference	Holden Beach	Holden Beach Reference
<i>Membras martinica</i>	Rough silverside			0.03						0.08			
<i>Menidia menidia</i>	Atlantic silverside			<0.01									
<i>Menippe mercenaria</i>	Florida stone crab			1.09									
<i>Menticirrhus americanus</i>	Southern kingfish	0.98	0.08	0.02	0.73			1.39	0.47	0.65	0.79		
<i>Menticirrhus littoralis</i>	Gulf kingfish	0.19	3.34	1.65	0.18			0.96	0.35	0.44	1.36		
<i>Menticirrhus saxatilis</i>	Northern kingfish	1.44	0.81	0.01				0.33				0.26	
<i>Micropogonias undulatus</i>	Atlantic croaker	0.23						0.05	0.21				
<i>Monacanthus hispidus</i>	Planehead filefish							0.11					
<i>Mugil curema</i>	White mullet							0.06					
<i>Narcine brasiliensis</i>	Lesser electric ray	0.01						0.02					
<i>Ophidion marginatum</i>	Striped cusk-eel	0.41						0.05	0.03		0.06		
<i>Opisthonema oglinum</i>	Atlantic thread herring	0.07						1.51	0.03				
<i>Orthopristis chrysoptera</i>	Pigfish												
<i>Ovalipes ocellatus</i>	Lady crab	2.88	2.83	0.26	0.86			0.63	3.50	2.03	4.42		
<i>Ovalipes stephensoni</i>	Coarsehand lady crab	14.29	2.57	0.56	0.12			0.09	0.57	2.81	0.46	4.60	
Paguridae	Right-handed hermit crabs	1.43	0.56	0.03	0.12			0.24	0.14	0.14	0.06	0.19	
<i>Paralichthys dentatus</i>	Summer flounder	0.17						0.02					
<i>Paralichthys lethostigma</i>	Southern flounder	0.04											
<i>Paralichthys oblongus</i>	Fourspot flounder	0.05											
<i>Penaeus aztecus</i>	Brown shrimp	0.02											
<i>Penaeus setiferus</i>	Northern white shrimp	0.35											
<i>Peprilus alepidotus</i>	Harvestfish	0.07	0.35	0.08	0.06			0.02	0.02	0.42	0.09	0.71	
<i>Peprilus triacanthus</i>	Butterfish	4.82	17.40	<0.01				0.03					
Polinices	Mottled purse crab	0.38	0.11	<0.01				0.05					
<i>Pomatomus saltatrix</i>	Moon snails	0.01											
<i>Portunus gibbesii</i>	Bluefish	0.01											
<i>Portunus sayi</i>	Iridescent swimming crab	0.05	0.68	0.08	0.19			1.37	0.63	0.52	0.78		
<i>Prionotus carolinus</i>	Sargassum swimming crab			<0.01				0.12		0.05			
<i>Prionotus evolans</i>	Northern searobin	0.05		<0.01	0.05			0.05	0.05	0.02	0.26		
<i>Prionotus scitulus</i>	Striped searobin	0.02		0.03	<0.01	0.05		0.05	0.05	0.21	0.02		
<i>Prionotus tribulus</i>	Leopard searobin	0.92	0.10	0.01				0.20	0.04	0.72	0.11	0.33	
<i>Raja eglanteria</i>	Bighead searobin	0.90	0.13	0.19	0.04			0.11	0.03				
<i>Rhizoprionodon terraenovae</i>	Clearnose skate	0.07	0.19	0.02				0.32	0.52	0.06	1.02		
<i>Scomberomorus maculatus</i>	Atlantic sharpnose shark												
<i>Scophthalmus aquosus</i>	Spanish mackerel												
<i>Selene setapinnis</i>	Windowpane	4.45	5.90	<0.01				0.04	0.06	0.13	0.06		
<i>Selene vomer</i>	Atlantic moonfish												
Serranidae	Lookdown												
	Groupers	0.06											

Table TR-1. (Continued)

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island 0.02	Holden Beach Reference	Caswell Beach	Holden Beach Reference 0.06	Oak Island Reference 0.14	Holden Beach Reference 0.13	Oak Island Reference 0.17	Holden Beach Reference 0.05	Holden Beach Reference 0.01	Holden Beach Reference 0.16		
<i>Sphoeroides maculatus</i>	Northern puffer												
<i>Sphyraena guachancho</i>	Guaguanche												
<i>Stellifer lanceolatus</i>	Star drum												
<i>Stomatopoda</i>	Mantis shrimp	0.23			13.31	0.13							
<i>Sympodus plagiatus</i>	Blackcheek tonguefish	0.05			0.04	0.05							
<i>Syngnathus floridae</i>	Dusky pipefish	0.02			0.28	0.16							
<i>Syngnathus fuscus</i>	Northern pipefish	0.15	0.23	<0.01									
<i>Synodus foetens</i>	Inshore lizardfish			<0.01									
<i>Trachinotus carolinus</i>	Florida pompano												
<i>Trachinotus lepturus</i>	Atlantic cutlassfish	0.14	0.17										
<i>Trinectes maculatus</i>	Hogchoker	1.05	0.65	2.12	0.48								
<i>Upeneus parvus</i>	Dwarf goatfish	6.60	3.31	0.01	0.06								
<i>Urophycis regia</i>	Spotted hake												
Xanthidae	Mud crabs												
Total		100	100	100	100	100	100	100	100	100	100		

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: NEKTON ABUNDANCE
HABITAT: TRAWL



Figure TR-1. Mean and associated standard error of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table TR-2. Mean (\bar{x}_i) and associated standard error (SE) of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	114.87	1	420.51	34.27	4			0				3.66
2	353.11	1	387.78	59.29	3	40.59		1	0.10	0.11	1.10	
3	75.72	1	447.88	166.60	3	199.05		1	0.44	2.63	5.92	
4	411.14	1	290.68	1	236.49	55.59	3	0.81	0.58	0.71		
Spring	238.71		386.71	64.50	158.71	63.98		0.41	0.66	1.62		

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: NEKTON ABUNDANCE
HABITAT: TRAWL

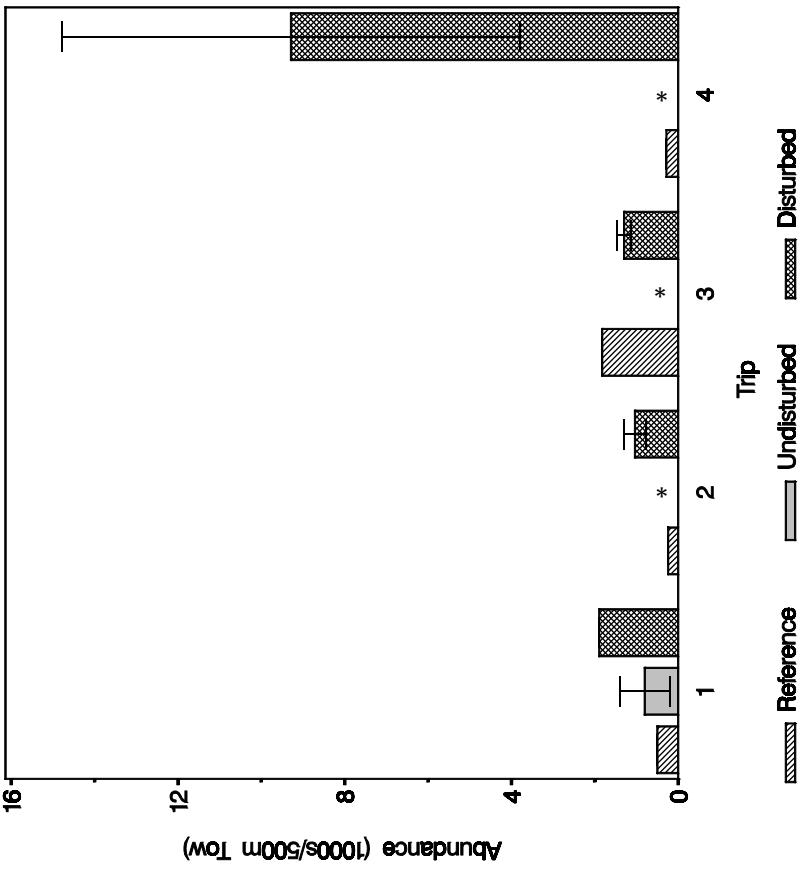


Figure TR-2. Mean and associated standard error of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table TR-3. Mean (\bar{x}_i) and associated standard error (SE) of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	500.36		1	798.99	594.29	3	1894.33		1	2.37	3.79	1.60
2	241.89		1			0	1037.69	270.27	4		4.29	
3	1820.97		1			0	1294.43	164.07	4		0.71	
4	282.96		1			0	9289.69	5504.05	4		32.83	
Summer	711.55			798.99			3379.04	2651.67	4.23	4.75	1.12	

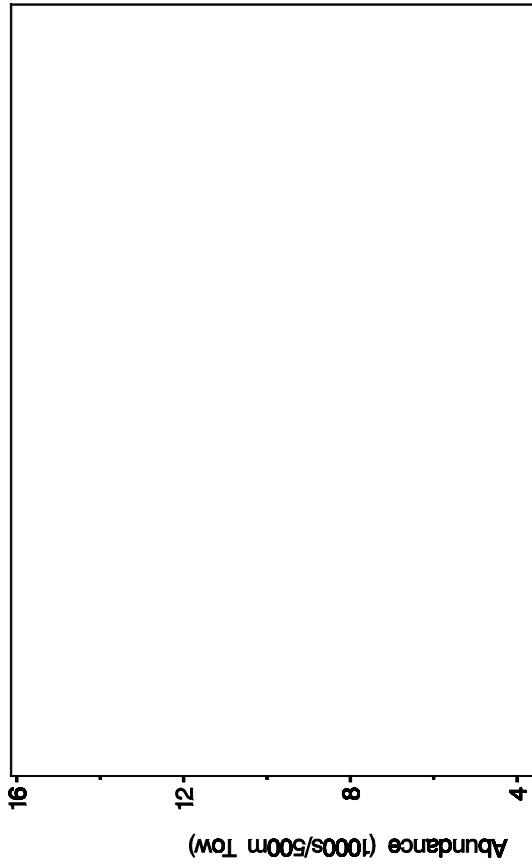


Figure TR-3. Mean and associated standard error of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table TR-4.

Mean (\bar{x}_i) and associated standard error (SE) of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed		
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N
1	147.58		1	124.88	30.33	4		0	
2	80.99		1	315.72	33.40	2	178.24	5.70	2
3	201.14		1			0	598.10	515.21	4
4	234.00		1			0	443.12	97.00	4
Fall	165.93			220.30	69.27		406.49	196.86	1.85
								2.45	1.33

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: NEKTON ABUNDANCE
HABITAT: TRAWL

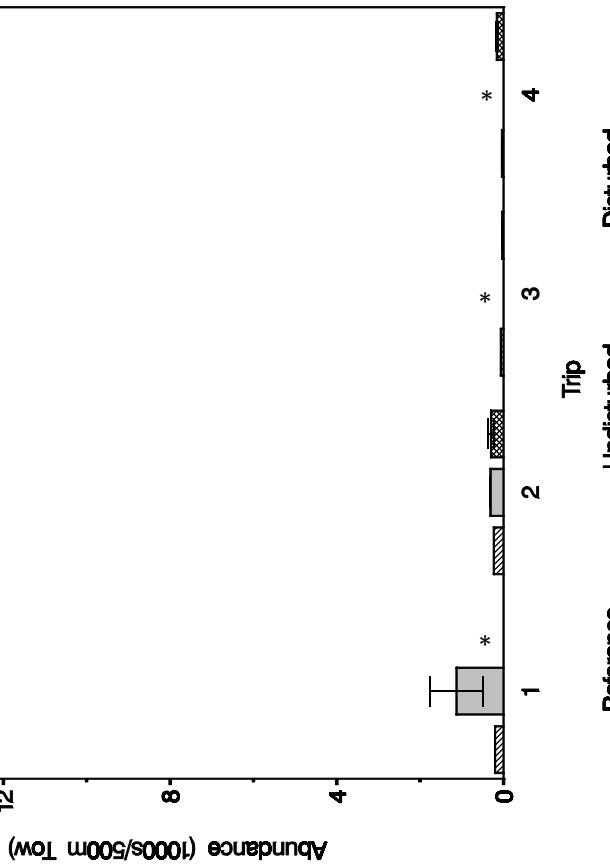


Figure TR-4. Mean and associated standard error of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table TR-5. Mean (\bar{x}_i) and associated standard error (SE) of total nekton abundance caught by trawl at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}	
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N				
1	201.14		1	1129.91		637.63	4			0		5.62	
2	234.00		1	313.87		1	302.07		79.32	3	0.96	1.29	
3	64.58		1			0	28.91		3.07	4		0.45	
4	37.41		1			0	161.77		18.94	4		4.32	
Winter	134.28			721.89		495.85		164.25		71.60	0.23	1.22	5.38

SITE:	BALD HEAD
SEASON:	SPRING
PARAMETER:	NEKTON DIVERSITY
HABITAT:	TRAWL

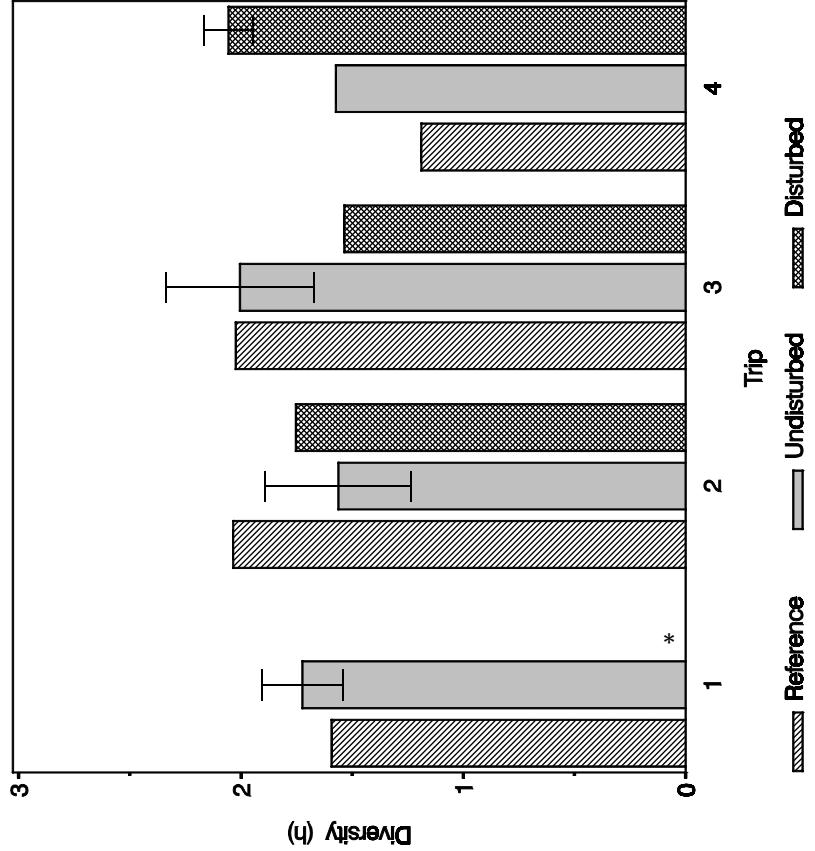


Figure TR-5. Mean and associated standard error of nekton diversity caught by trawl at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table TR-6. Mean (\bar{x}_i) and associated standard error (SE) of nekton diversity caught by trawl at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N		
1	1.59		1	1.72	0.18	4			0		1.08
2	2.03		1	1.56	0.33	3	1.75		1	1.12	0.86
3	2.02		1	2.00	0.33	3	1.54		1	0.77	0.76
4	1.19		1	1.57		1	2.06	0.11	3	1.31	1.73
Spring	1.71			1.72	0.19		1.78	0.15		1.04	1.00

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: NEKTON DIVERSITY
HABITAT: TRAWL

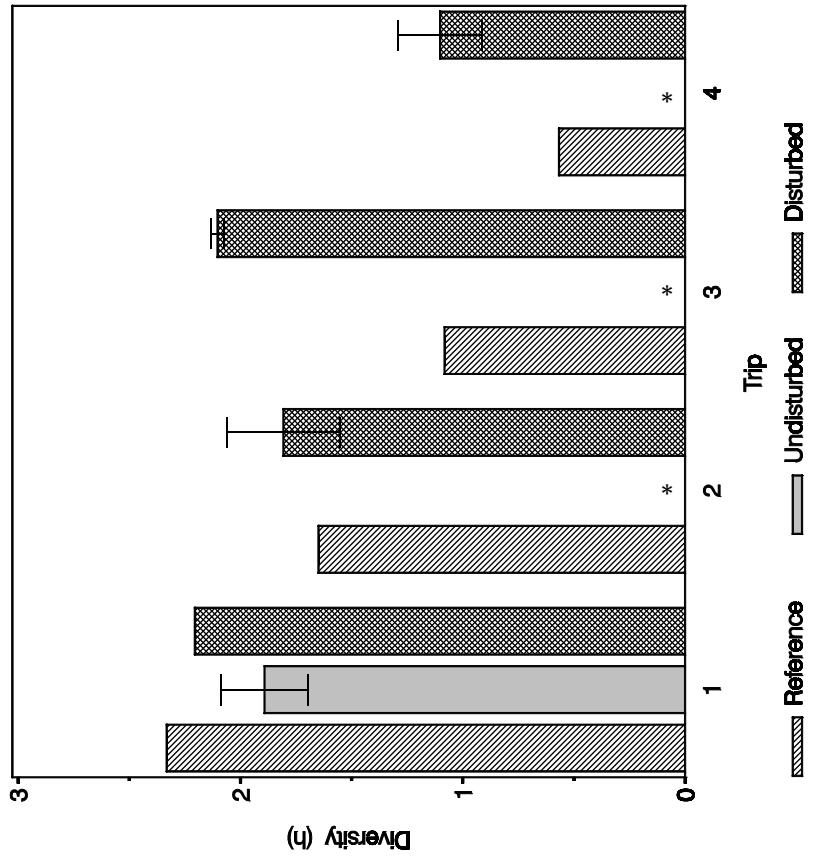


Figure TR-6. Mean and associated standard error of nekton diversity caught by trawl at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table TR-7. Mean (\bar{x}_i) and associated standard error (SE) of nekton diversity caught by trawl at the disturbed and undisturbed stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference	Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	
1	2.33	1	1.89	0.19	3	2.20	1	1.17	0.95	0.81
2	1.65	1		0	1.81	0	0.26	4		1.10
3	1.08	1		0	2.10	0	0.03	4		1.94
4	0.57	1		0	1.10	0	0.19	4		1.94
Summer	1.41		1.89		1.80	0.27	0.95	1.28	1.34	

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: NEKTON DIVERSITY
HABITAT: TRAWL

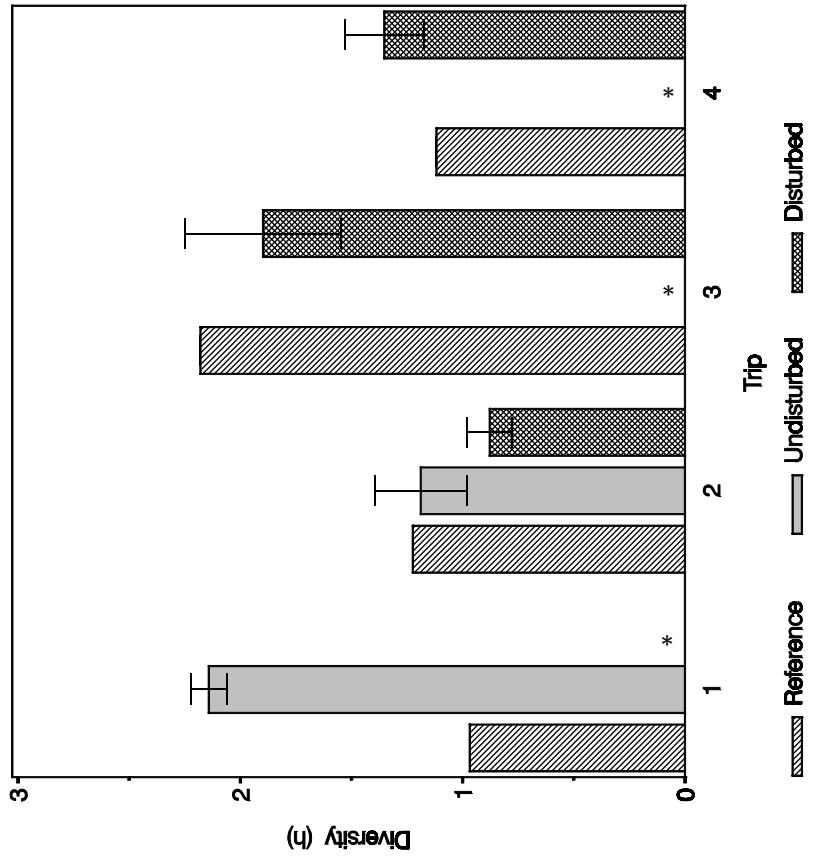


Figure TR-7. Mean and associated standard error of nekton diversity caught by trawl at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table TR-8. Mean (\bar{x}_i) and associated standard error (SE) of nekton diversity caught by trawl at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.97		1	2.14	0.08	4			0			2.21
2	1.22		1	1.19	0.21	2	0.88	0.10	2	0.74	0.72	0.97
3	2.18		1			0	1.90	0.35	4		0.87	
4	1.12		1			0	1.35	0.18	4		1.21	
Fall	1.37			1.67	0.34		1.38	0.28		0.83	1.00	1.21

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	NEKTON DIVERSITY
HABITAT:	TRAWL

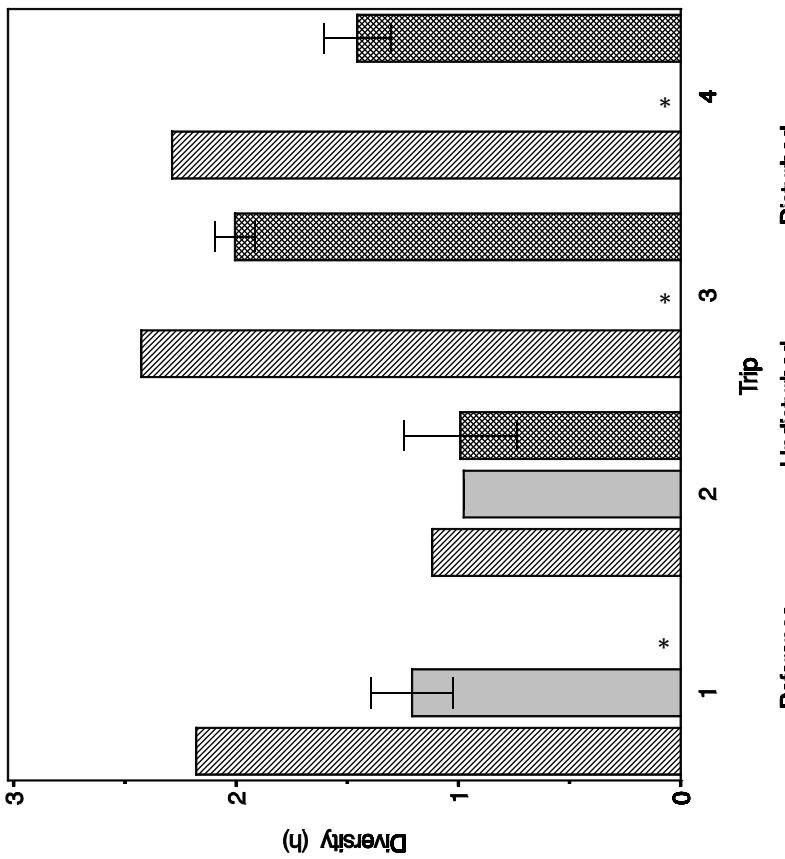


Table TR-9. Mean (\bar{x}_i) and associated standard error (SE) of nekton diversity caught by trawl at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	2.18		1	1.21	0.18	4			0			0.55
2	1.12		1	0.98		1	0.99	0.25	3	1.02	0.89	0.87
3	2.43		1			0	2.00	0.09	4		0.83	
4	2.29		1			0	1.45	0.15	4		0.64	
Winter	2.00			1.09	0.14		1.48	0.27		1.36	0.74	0.55

Table TR-10. Nekton parameter interval estimates (90% confidence level) for differences between categories of trawl stations. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0. Shaded intervals are statistically significant.

Parameter	Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
		CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Abundance	Spring					78.09	377.92
Diversity						-0.46	0.33
Abundance	Summer						
Diversity							
Abundance	Fall					-530.54	158.16
Diversity						-0.45	1.03
Abundance	Winter					-269.00	1384.28
Diversity						-0.89	0.11
Abundance	All					-2742.28	1751.99
Diversity						-0.59	0.55

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

GILLNET

Table GI-1. Gillnet species list and total percent composition

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference						
<i>Alosa mediocris</i>	Hickory shad												
<i>Alosa sapidissima</i>	American shad												
<i>Brevoortia tyrannus</i>	Atlantic menhaden	47.20			21.73			0.37		0.64		0.43	
<i>Callinectes sapidus</i>	Blue crab				0.37			0.08		1.25		0.06	
<i>Callinectes similis</i>	Lesser blue crab				0.37							92.79	
<i>Carcharhinus brevipinna</i>	Spinner shark				1.82								
<i>Carcharhinus isodon</i>	Finetooth shark	1.45			1.72								
<i>Carcharhinus obscurus</i>	Dusky shark				0.63			0.03					
<i>Chloroscombrus chrysurus</i>	Atlantic bumper				0.49			0.09					
<i>Cynoscion nebulosus</i>	Spotted seatrout												
<i>Cynoscion regalis</i>	Weakfish												
<i>Dasyatis americana</i>	Southern stingray	0.13											
<i>Elops saurus</i>	Ladyfish	0.62			1.96			4.83		4.76		1.41	
<i>Leiostomus xanthurus</i>	Spot	0.67			1.27			0.37					
<i>Libinia dubia</i>	Longnose spider crab				0.37								
<i>Libinia emarginata</i>	Portly spider crab				0.03								
<i>Menticirrhus americanus</i>	Southern kingfish				0.50								
<i>Menticirrhus littoralis</i>	Gulf kingfish												
<i>Menticirrhus saxatilis</i>	Northern kingfish	1.28			3.12								
<i>Micropogonias undulatus</i>	Atlantic croaker	0.98			2.99								
<i>Mustelus canis</i>	Smooth dogfish	5.48			2.09								
<i>Myliobatis freminvillei</i>	Bullnose ray				0.33								
<i>Oligoplites saurus</i>	Leatherjack				0.33								
<i>Opisthonema oglinum</i>	Atlantic thread herring	8.96			4.83								
<i>Ovalipes ocellatus</i>	Lady crab	3.42			9.66								
<i>Paralichthys oblongus</i>	Fourspot flounder												
<i>Pepilus alepidotus</i>	Harvestfish				0.75								
<i>Pepilus triacanthus</i>	Butterfish	0.64											
<i>Pomatomus saltatrix</i>	Bluefish	2.55			16.29			44.44		23.02		1.29	
<i>Portunus sayi</i>	Sargassum swimming crab												
<i>Raja eglanteria</i>	Clearnose skate	0.99											
<i>Rhinoptera bonasus</i>	Cownose ray	4.52			11.61								
<i>Rhizoprionodon terraenovae</i>	Atlantic sharpnose shark	20.84	6.47		21.82			4.35					
<i>Scomberomorus maculatus</i>	Spanish mackerel				8.27			4.83					
<i>Sphyrna lewini</i>	Scalloped hammerhead				1.08								
<i>Sphyrna tiburo</i>	Bonnethead				1.67								
<i>Squalus acanthias</i>	Spiny dogfish												
<i>Trachinotus carolinus</i>	Florida pompano												
<i>Trinectes maculatus</i>	Hogchoker												
Total		100	100	100	100	100	100	100	100	100	100	100	100

Table GI-2. Mean gillnet catch per one hour of soak time by season and corresponding reference site

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference						
<i>Alosa mediocris</i>	Hickory shad												
<i>Alosa sapidissima</i>	American shad	128.69		57.73		237.72		87.77		50.46		0.36	0.67
<i>Brevoortia tyrannus</i>	Atlantic menhaden			0.99							0.7	0.10	
<i>Callinectes sapidus</i>	Blue crab			0.99								143.34	
<i>Callinectes similis</i>	Lesser blue crab			4.84									
<i>Carcharhinus isodon</i>	Spinner shark	3.96		4.57									
<i>Carcharhinus obscurus</i>	Fineooth shark												
<i>Carcharhinus chrysurus</i>	Dusky shark												
<i>Chloroscombrus chrysurus</i>	Atlantic bumper												
<i>Cynoscion nebulosus</i>	Spotted seatrout												
<i>Cynoscion regalis</i>	Weakfish	0.35		0.1								0.12	
<i>Dasyatis americana</i>	Southern stingray			0.29									
<i>Elops saurus</i>	Ladyfish												
<i>Leiostomus xanthurus</i>	Spot	1.68		1.67								0.79	
<i>Libinia dubia</i>	Longnose spider crab			16.05									
<i>Libinia emarginata</i>	Portly spider crab	1.84		3.36									
<i>Menticirrhus americanus</i>	Southern kingfish			0.99									
<i>Menticirrhus littoralis</i>	Gulf kingfish	3.49		8.28									
<i>Menticirrhus saxatilis</i>	Northern kingfish	2.67		5.54									
<i>Micropanchax undulatus</i>	Atlantic croaker												
<i>Mustelus canis</i>	Smooth dogfish	14.94		0.89									
<i>Myliobatis frenimillei</i>	Bullnose ray			0.18									
<i>Oligoplites saurus</i>	Leatherjack												
<i>Opisthonema oglinum</i>	Atlantic thread herring	24.42		14.43									
<i>Ovalipes ocellatus</i>	Lady crab	9.33		2.9									
<i>Paralichthys oblongus</i>	Fourspot flounder			3.33									
<i>Pepodus alepidotus</i>	Harvestfish			1.67									
<i>Pepodus triacanthus</i>	Butterfish	1.76		3.33									
<i>Pomatomus saltatrix</i>	Bluefish	6.96		2									
<i>Portunus sayi</i>	Sargassum swimming crab			15.33									
<i>Raja eglanteria</i>	Clearnose skate	2.69		77.67									
<i>Rhinoptera bonasus</i>	Cownose ray	12.31		30.85									
<i>Rhizoprionodon terraenovae</i>	Atlantic sharpnose shark	56.82		5.09									
<i>Scomberomorus maculatus</i>	Spanish mackerel			57.97									
<i>Sphyraena lewini</i>	Scalloped hammerhead			21.96									
<i>Sphyraena tiburo</i>	Bonnethead			2.88									
<i>Squalus acanthias</i>	Spiny dogfish			4.44									
<i>Trachinotus carolinus</i>	Florida pompano			9.33									
<i>Trinectes maculatus</i>	Hogchoker	0.77		1.24									
				1.76									10.09

ICHTHYOPLANKTON

Table IC-1. Ichthyoplankton species list and total percent composition

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference						
<i>Anchoa</i> spp.	Common anchovy	56.22	91.31	81.65	67.49								
<i>Anchoa mitchilli</i>	Bay anchovy												
<i>Anguilla rostrata</i>	American eel												
<i>Brevoortia tyrannus</i>	Atlantic menhaden												
<i>Caranx cryos</i>	Blue runner												
<i>Centropristes striata</i>	Black sea bass												
<i>Cynoscion nebulosus</i>	Spotted seatrout												
<i>Cynoscion regalis</i>	Weakfish	3.32	1.47	2.64	1.88	2.25	19.84						10.32
<i>Gobiosox strumosus</i>	Skillifish	0.01	4.97	3.47	3.47	14.52	0.54						
<i>Gobiosoma bosc</i>	Naked goby	32.69	10.98	4.84	4.84	2.79							1.14
<i>Hippocampus erectus</i>	Lined seahorse					6.53							
<i>Hypsoblennius hentzi</i>	Feather blenny												
<i>Lagodon rhomboides</i>	Pinfish												
<i>Larimus fasciatus</i>	Banded drum												
<i>Megalops atlanticus</i>	Tarpon	3.55	1.06	0.14	0.14	5.59							
<i>Menidia menidia</i>	Atlantic silverside					0.1							
<i>Menticirrhus</i> spp.	Kingfishes					0.26							
<i>Menticirrhus americanus</i>	Southern kingfish	0.95											14.15
<i>Microgongias undulatus</i>	Atlantic croaker	0.03											
<i>Monacanthus hispidus</i>	Planehead filefish	0.01											
Osteichthyes													
<i>Peprilus alepidotus</i>	Bony fishes	0.05	0.38										
<i>Peprilus triacanthus</i>	Harvestfish												
<i>Pomatomus saltatrix</i>	Butterfish	0.15	0.67	1.09	1.88	12.47							5.6
<i>Scophthalmus aquosus</i>	Bluefish	2.64											
Serranidae	Windowpane	0.01											
<i>Sphoeroides maculatus</i>	Groupers	0.01											
<i>Syngnathus floridae</i>	Northern puffer	0.06											
<i>Syngnathus fuscus</i>	Dusky pipefish	0.14											
<i>Tinectes maculatus</i>	Northern pipefish	0.13											
	Hogchoker												
Total		100	100	100	100	100	100	100	100	100	100	100	100

Table IC-2. Mean ichthyoplankton densities (per cubic meters) by season and corresponding reference site

Scientific Name	Common Name	Spring			Summer			Fall			Winter		
		Bald Head Island	Holden Beach Reference	Caswell Beach	Holden Beach Reference	Oak Island	Holden Beach Reference						
<i>Anchoa</i> spp.	Common anchovy	3499.69	506.06	1042.38	36.40			0.59	3.79		26.37	0.95	
<i>Anchoa mitchilli</i>	Bay anchovy							0.73			0.71		
<i>Anguilla rostrata</i>	American eel												
<i>Brevoortia tyrannus</i>	Atlantic menhaden												
<i>Caranx cryos</i>	Blue runner												
<i>Centropristes striata</i>	Black sea bass												
<i>Cynoscion nebulosus</i>	Spotted seatrout	206.76	8.13	33.75		1.01	1.7						
<i>Cynoscion regalis</i>	Weakfish	0.83				1.87							
<i>Gobiosox strumosus</i>	Skillifish	2034.75	27.57	140.2		2.61							
<i>Gobiosoma bosc</i>	Naked goby												
<i>Hippocampus erectus</i>	Lined seahorse												
<i>Hypsoblennius henetti</i>	Feather blenny												
<i>Lagodon rhomboides</i>	Pinfish												
<i>Larimus fasciatus</i>	Banded drum	221.06	5.9	1.78									
<i>Megalops atlanticus</i>	Tarpon			1.25									
<i>Menidia menidia</i>	Atlantic silverside												
<i>Menticirrhus</i> spp.	Kingfishes	58.86	3.26			1.46							
<i>Menticirrhus americanus</i>	Southern kingfish	1.93											
<i>Microgongias undulatus</i>	Atlantic croaker	0.83											
<i>Monacanthus hispidus</i>	Planehead filefish	0.91											
Osteichthyes													
<i>Pepilis alepidotus</i>	Bony fishes	3.01	2.1										
<i>Pepilis triacanthus</i>	Harvestfish												
<i>Pomatomus saltatrix</i>	Butterfish	9.63	3.71	13.93									
<i>Scophthalmus aquosus</i>	Bluefish	164.41											
Serranidae	Windowpane	0.91											
<i>Sphoeroides maculatus</i>	Groupers	0.83											
<i>Syngnathus floridae</i>	Northern puffer	3.67											
<i>Syngnathus fuscus</i>	Dusky pipefish	8.82											
<i>Tinectes maculatus</i>	Northern pipefish	8.31											
	Hogchoker												
								0.81	39.22	7.78			

STOMACH CONTENT DATA

Table ST-1. Stomach content data: Bald Head Island; Trip 1; spring 2001

Percent of fish in sample series with prey item present

Table ST-2. Stomach content data: Bald Head Island; Trip 3; spring 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Leiostomus xanthurus</i>	13	Trawl	0	1	0	0	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	1	0	0	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	1	0	0	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	0	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
<i>Leiostomus xanthurus</i>	13	Trawl	0	0	0	1	0	0	1
Sum			0	3	0	5	0	0	8
Percent of fish in sample series with prey item present			0	37.5	0	62.5	0	0	100

Table ST-3. Stomach content data: Bald Head Island; Trip 4; spring 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Leiostomus xanthurus</i>	5	Seine	0	1	1	0	1	0	1
<i>Leiostomus xanthurus</i>	5	Seine	0	0	0	0	0	0	1
<i>Leiostomus xanthurus</i>	5	Seine	0	1	0	1	0	0	1
<i>Leiostomus xanthurus</i>	5	Seine	0	1	0	0	0	0	1
<i>Leiostomus xanthurus</i>	5	Trawl	0	0	0	0	0	1	0
<i>Leiostomus xanthurus</i>	5	Trawl	0	1	0	1	0	0	1
<i>Leiostomus xanthurus</i>	11	Gillnet	0	0	0	0	0	0	0
Sum			0	4	1	2	2	1	5
Percent of fish in sample series with prey item present			0	57.14	14.27	28.57	28.57	14.286	71.43
Species	Station	Site	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Menticirrhus littoralis</i>	5	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	11	Trawl	1	0	0	1	0	0	0
<i>Menticirrhus littoralis</i>	11	Trawl	1	0	0	0	0	1	1
<i>Menticirrhus littoralis</i>	11	Trawl	0	1	0	1	0	0	1
<i>Menticirrhus littoralis</i>	11	Gillnet	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	11	Gillnet	1	0	0	0	0	0	0
Sum			5	1	0	2	0	1	2
Percent of fish in sample series with prey item present			83.33	16.67	0	33.33	0	16.67	33.33

Table ST-4. Stomach content data: Caswell Beach; Trip 1; summer 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Menticirrhus littoralis</i>	21	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	21	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	21	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	23	Seine	0	0	1	0	0	0	1
<i>Menticirrhus littoralis</i>	23	Seine	0	0	0	0	0	1	0
Sum			3	0	1	0	0	1	1
Percent of fish in sample series with prey item present			60	0	20	0	0	20	20
Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Sciaenops ocellatus</i>	21	Seine	0	0	0	0	1	1	0
<i>Sciaenops ocellatus</i>	21	Seine	0	0	0	0	0	1	0
Sum			0	0	0	0	1	2	0
Percent of fish in sample series with prey item present			0	0	0	50	100	0	0

Table ST-5. Stomach content data: Caswell Beach; Trip 3; summer 2001

Table ST-6. Stomach content data: Oak Island; Trip 1; fall 2001

Table ST-6. Stomach content data: Oak Island; Trip 1; fall 2001									
Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	1	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	0	0	1	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	0	0	1	0	0	0	1
<i>Menticirrhus littoralis</i>	41-48	Seine	0	0	0	0	0	0	1
<i>Menticirrhus littoralis</i>	41-48	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	1	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	41-48	Seine	1	0	0	0	0	0	0
Sum		9	0	4	0	0	0	0	2
Percent of fish in sample series with prey item present		75	0	33.33	0	0	0	0	16.67

Table ST-7. Stomach content data: Oak Island; Trip 4; fall 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Pogonias cromis</i>	81	Seine	1	0	0	0	0	0	0
Sum			1	0	0	0	0	0	0
Percent of fish in sample series with prey item present			100	0	0	0	0	0	0
Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Menticirrhus littoralis</i>	81	Seine	1	0	0	0	1	0	0
<i>Menticirrhus littoralis</i>	81	Seine	1	0	0	0	1	0	0
<i>Menticirrhus littoralis</i>	81	Seine	1	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	1	0	0	1
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	1
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
Sum			4	0	0	0	1	2	0
Percent of fish in sample series with prey item present			28.57	0	0	7.14	14.29	0	14.29
Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Leiostomus xanthurus</i>	41-48	Seine	0	0	0	0	0	0	0
<i>Leiostomus xanthurus</i>	41-48	Seine	0	0	0	0	0	0	0
<i>Leiostomus xanthurus</i>	41-48	Seine	0	0	0	0	0	0	0
<i>Leiostomus xanthurus</i>	41-48	Seine	0	0	0	0	0	0	0
<i>Leiostomus xanthurus</i>	41-48	Seine	0	0	0	0	0	0	0
Sum			0	0	0	0	0	0	0
Percent of fish in sample series with prey item present			0	0	0	0	0	0	0

Table ST-8. Stomach content data: Holden Beach; Trip 3; winter 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Pogonias cromis</i>	81	Seine	1	0	0	0	1	0	0
Sum			1	0	0	0	1	0	0
Percent of fish in sample series with prey item present			100	0	0	0	100	0	0

Table ST-9. Stomach content data: Holden Beach; Trip 4; winter 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalve	Fish	UN-ID Other
<i>Menticirrhus littoralis</i>	81	Seine	0	0	0	0	0	0	0
Sum			0	0	0	0	0	0	0
Percent of fish in sample series with prey item present			0	0	0	0	0	0	0

Table ST-10. Stomach content data: Caswell Beach; 1st Quarterly Sampling; winter 2001

Species	Station	Gear	Decapoda	Amphipoda	Other Crust.	Worms	Bivalves	Fish	UN-ID Other
<i>Micropogonias undulatus</i>	21	Trawl	0	0	0	0	1	0	0
<i>Micropogonias undulatus</i>	21	Trawl	0	0	0	0	1	0	0
<i>Micropogonias undulatus</i>	23	Trawl	0	0	1	0	1	0	0
Sum			0	0	1	0	3	0	0
Percent of fish in sample series with prey item present			0	0	33.33	0	100	0	0
<i>Menticirrhus americanus</i>	23	Trawl	1	0	0	0	0	0	0
Sum			1	0	0	0	0	0	0
Percent of fish in sample series with prey item present			100	0	0	0	0	0	0

FLORIDA POMPANO

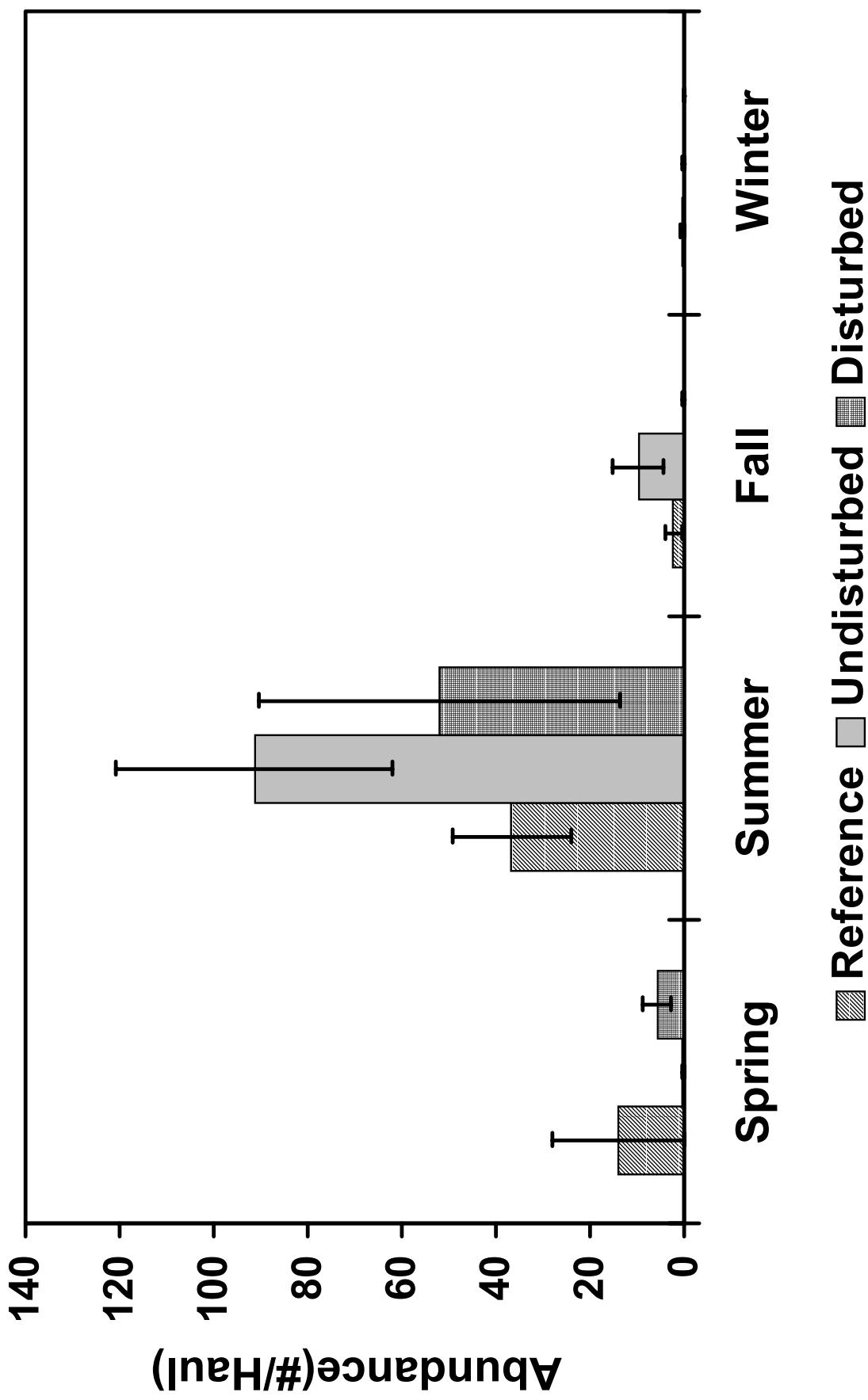


Figure P0-1. Mean and associated standard error of the Florida pompano caught by seine at the disturbed, undisturbed, and reference stations for each of the sampling periods.

SITE:	Bald Head
SEASON:	Spring
PARAMETER:	Florida Pompano Abundance
GEAR:	Seine

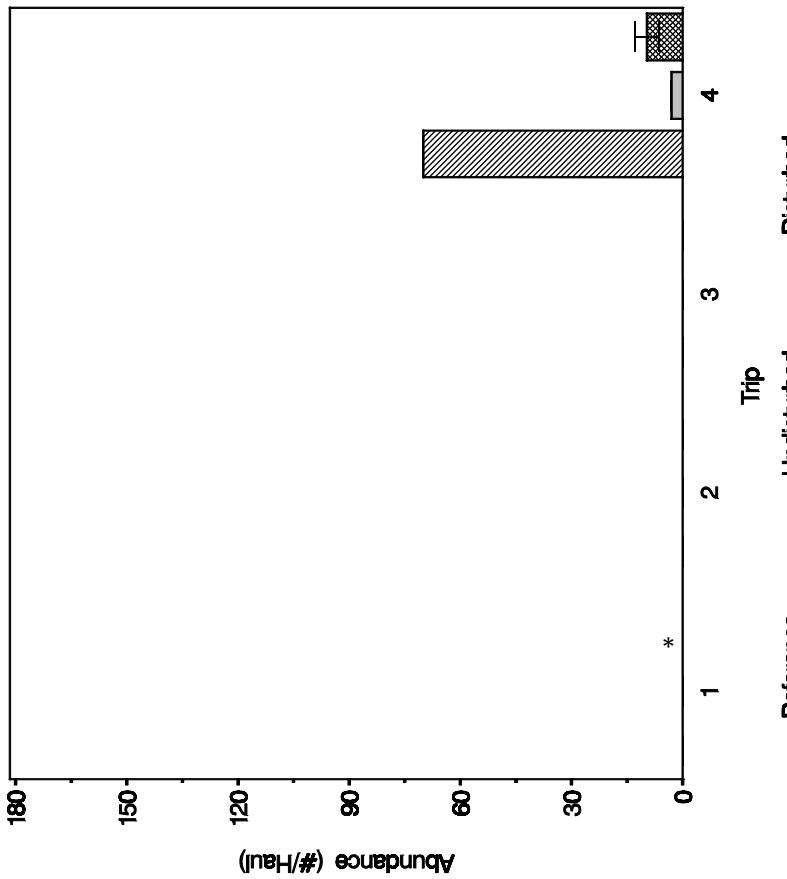


Figure PO-2. Mean and associated standard error of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table PO-1. Mean (\bar{x}_i) and associated standard error (SE) of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.00	0.00	2	0.00	0.00	4			0			
2	0.00		1	0.00	0.00	3	0.00		1			
3	0.00		1	0.00	0.00	3	0.00		1			
4	70.00		1	3.00		1	9.67	3.18	3	3.22	0.14	0.04
Spring	17.50	17.50		0.75	0.75		3.22	3.51		4.30	0.18	0.04

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: FLORIDA POMPANO ABUNDANCE
GEAR: SEINE

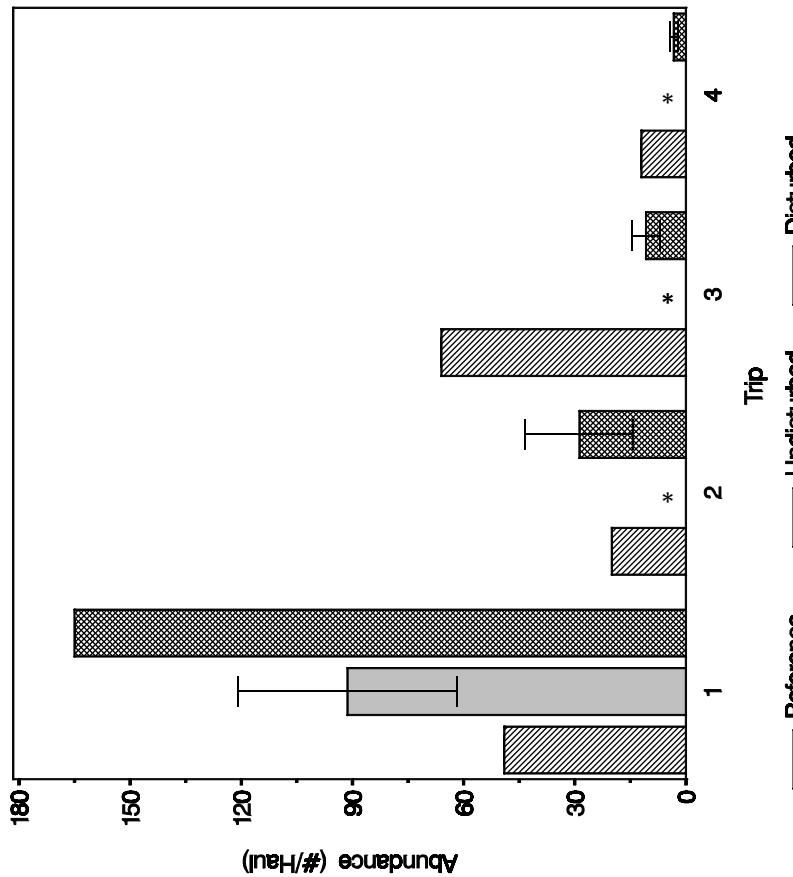


Figure PO-3. Mean and associated standard error of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table PO-2. Mean (\bar{x}_i) and associated standard error (SE) of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	49.00		1	91.33	29.45	3	165.00		1	1.81	3.37	1.86
2	20.00		1				28.75	14.61	4		1.44	
3	66.00		1				10.75	3.88	4		0.16	
4	12.00		1				3.25	1.11	4		0.27	
Summer	36.75		91.33		51.94	38.37		0.57	1.41	2.49		

SITE:	OAK ISLAND
SEASON:	FALL
PARAMETER:	FLORIDA POMPANO ABUNDANCE
GEAR:	SEINE

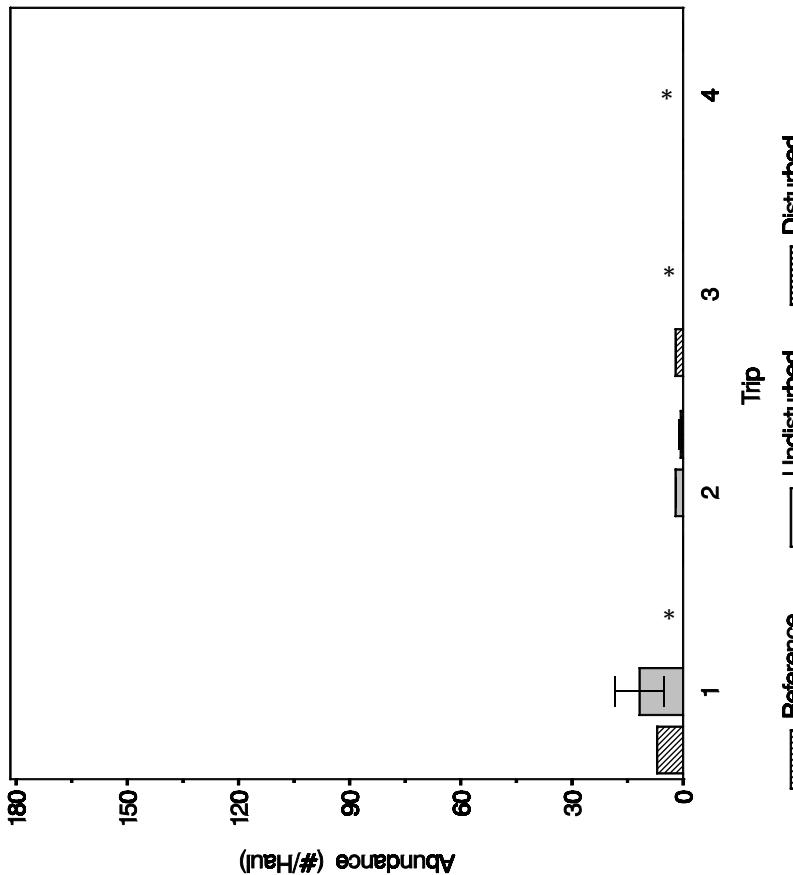


Figure PO-4. Mean and associated standard error of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table PO-3. Mean (\bar{x}_i) and associated standard error (SE) of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference			Undisturbed			Disturbed			R_{du}	R_{dr}	R_{ur}
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N			
1	7.00		1	11.75	6.60	4			0			1.68
2	0.00		1	2.00		1	0.67	0.33	3	0.33		
3	2.00		1			0	0.00	0.00	4		0.00	
4	0.00		1			0	0.00	0.00	4			
Fall	2.25			6.88	5.41		0.22	0.21	0.03	0.10	3.06	

SITE:	HOLDEN BEACH
SEASON:	WINTER
PARAMETER:	FLORIDA POMPANO ABUNDANCE
GEAR:	SEINE

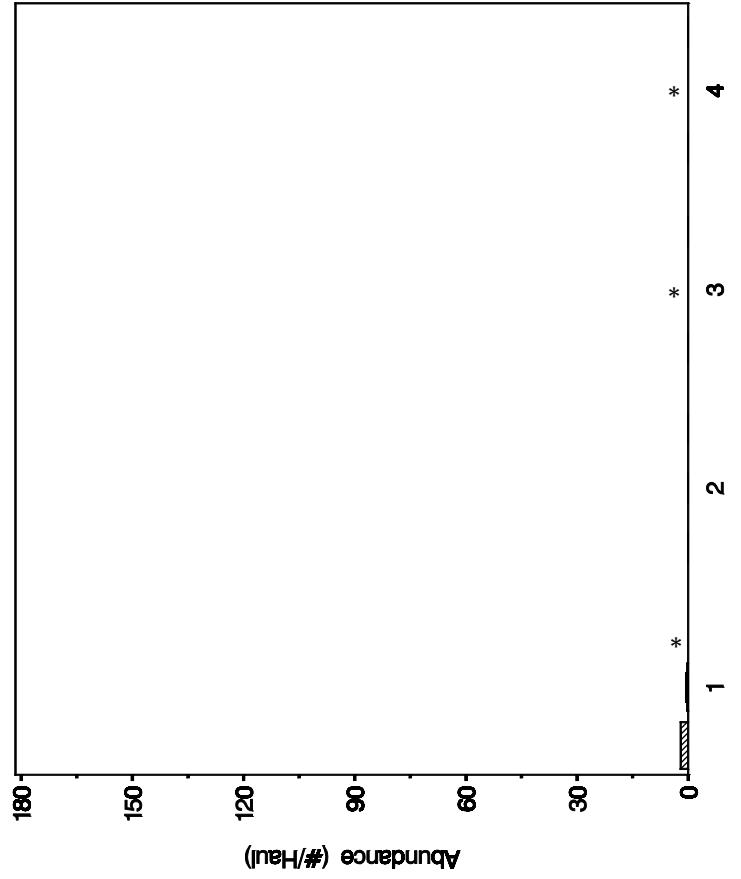


Figure PO-5. Mean and associated standard error of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table PO-4. Mean (\bar{x}_i) and associated standard error (SE) of Florida pompano abundance caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	2.00		1	0.25	0.25	4			0			0.13
2	0.00		1	0.00	0.00	2	0.00	0.00	2			
3	0.00		1			0	0.00	0.00	4			
4	0.00		1			0	0.00	0.00	4			
Winter	0.50			0.13	0.14		0.00	0.00	0.00	0.00	0.00	0.25

Table PO-5. Florida pompano abundance interval estimates (90% confidence level) for differences between categories of seine stations. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0.

Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Spring	-12.15	45.65	-15.17	43.73	-8.40	3.45
Summer						
Fall					-2.29	15.59
Winter					-0.10	0.35
All	-39.86	18.82	-42.54	43.35	-21.29	43.14

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

GULF KINGFISH

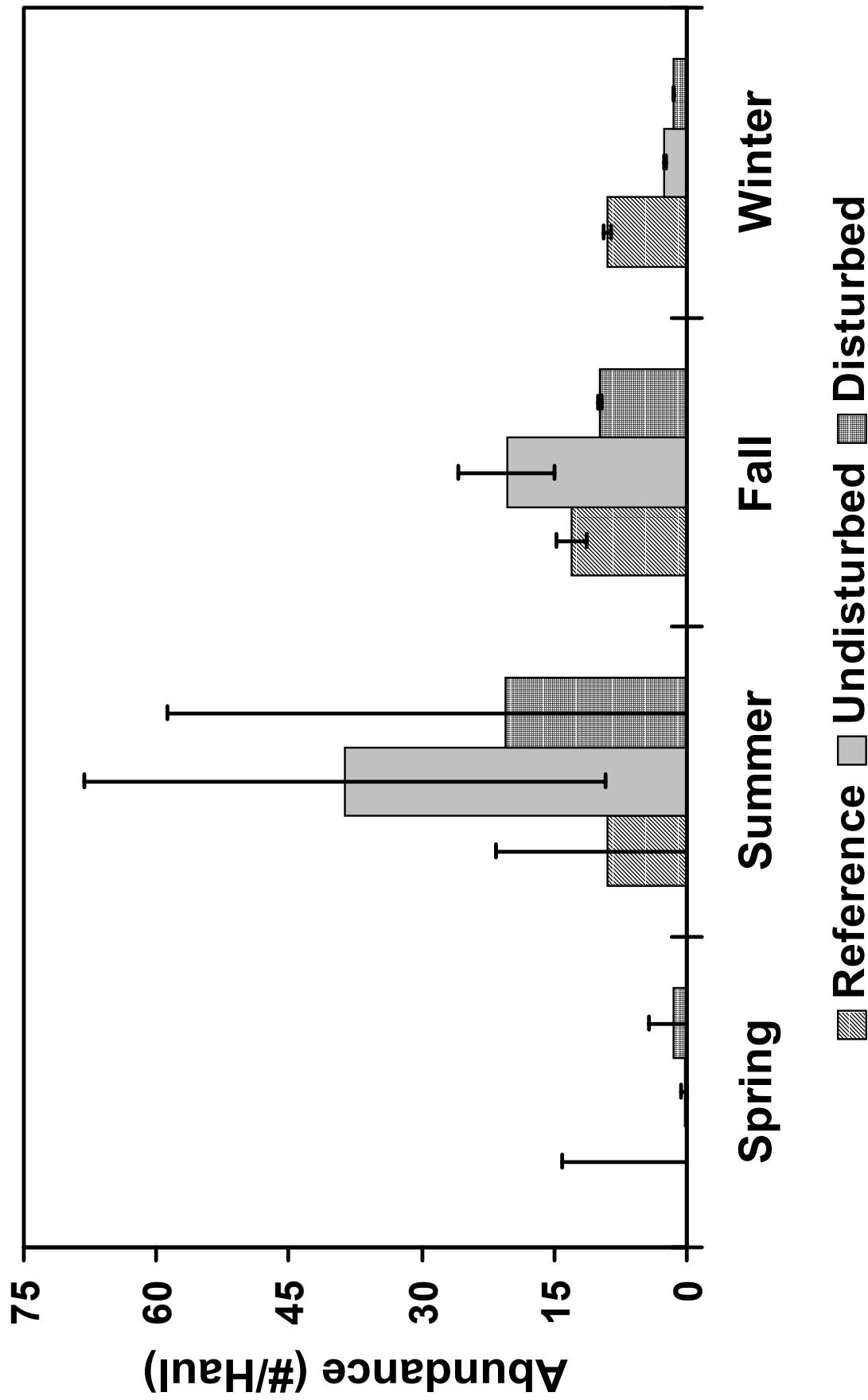


Figure KI-1. Mean and associated standard error of the Gulf Kingfish caught by seine at the disturbed, undisturbed, and reference stations for each of the sampling periods.

SITE: BALD HEAD
SEASON: SPRING
PARAMETER: GULF KINGFISH ABUNDANCE
GEAR: SEINE

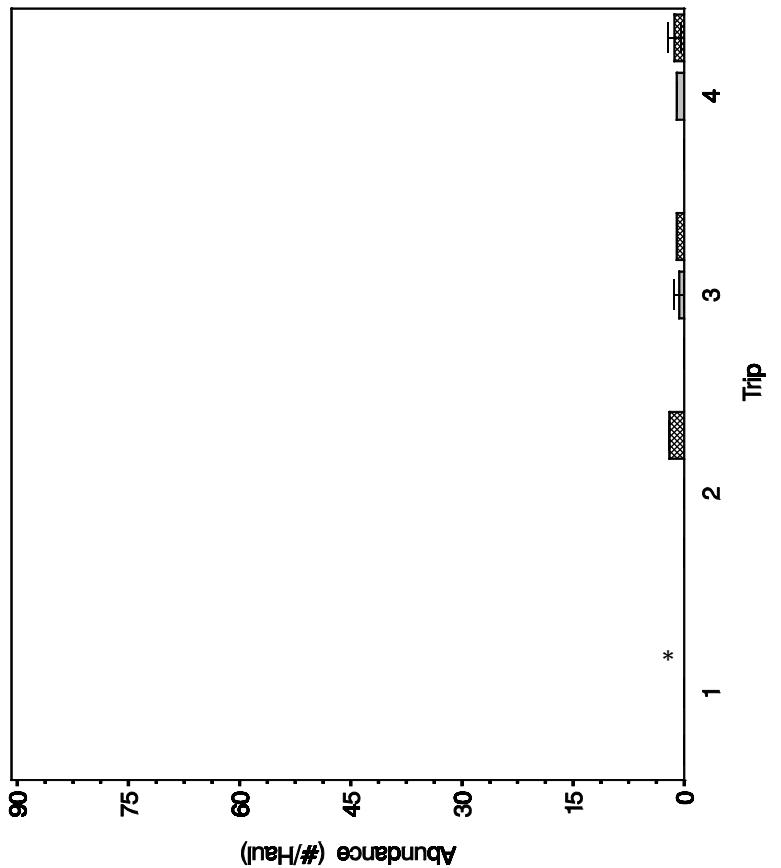


Figure KI-2. Mean and associated standard error of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) for all trips during the spring sampling period; * indicates that no stations were available for sampling in that category.

Table KI-1. Mean (\bar{x}_i) and associated standard error (SE) of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Bald Head Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the spring sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	0.00	0.00	2	0.00	0.00	4			0			
2	0.00		1	0.00	0.00	3	2.00		1			
3	0.00		1	0.67	0.67	3	1.00		1	1.50		
4	0.00		1	1.00		1	1.33	0.88	3	1.33		
Spring	0.00	0.00		0.42	0.32		1.44	0.64		3.47		

SITE: CASWELL BEACH
SEASON: SUMMER
PARAMETER: GULF KINGFISH ABUNDANCE
GEAR: SEINE

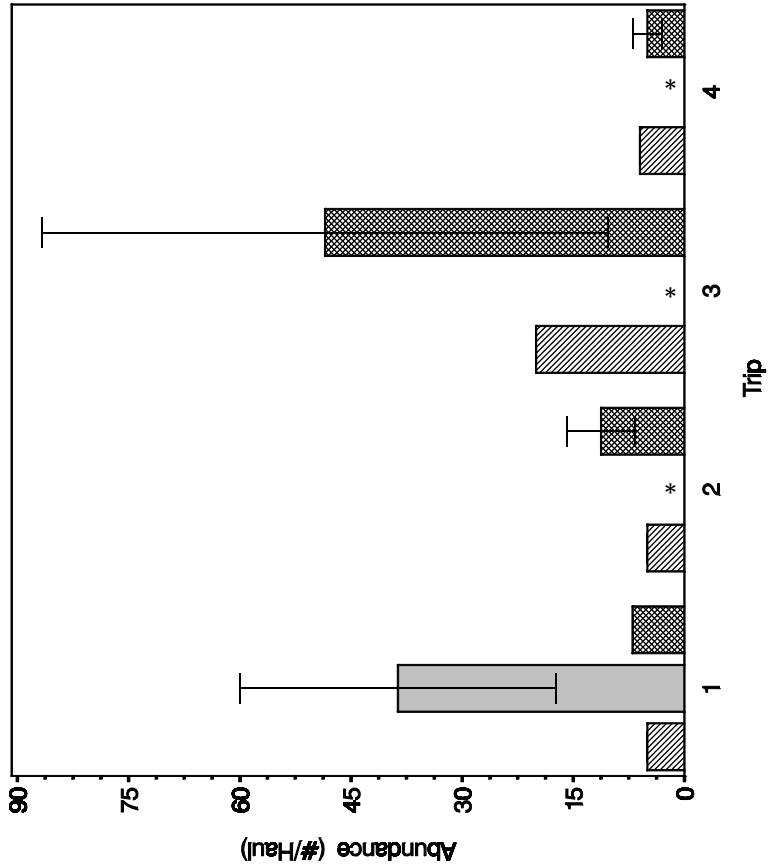


Figure KI-3. Mean and associated standard error of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) for all trips during the summer sampling period; * indicates that no stations were available for sampling in that category.

Table KI-2. Mean (\bar{x}_i) and associated standard error (SE) of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Caswell Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the summer sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	5.00		1	38.67		21.33	3	7.00		1	0.18	1.40
2	5.00		1			0	11.25	4.55	4			2.25
3	20.00		1			0	48.50	38.26	4			2.43
4	6.00		1			0	5.00	2.00	4			0.83
Summer	9.00			38.67			17.94		16.07	0.46	1.99	4.30

SITE: OAK ISLAND
SEASON: FALL
PARAMETER: GULF KINGFISH ABUNDANCE
GEAR: SEINE

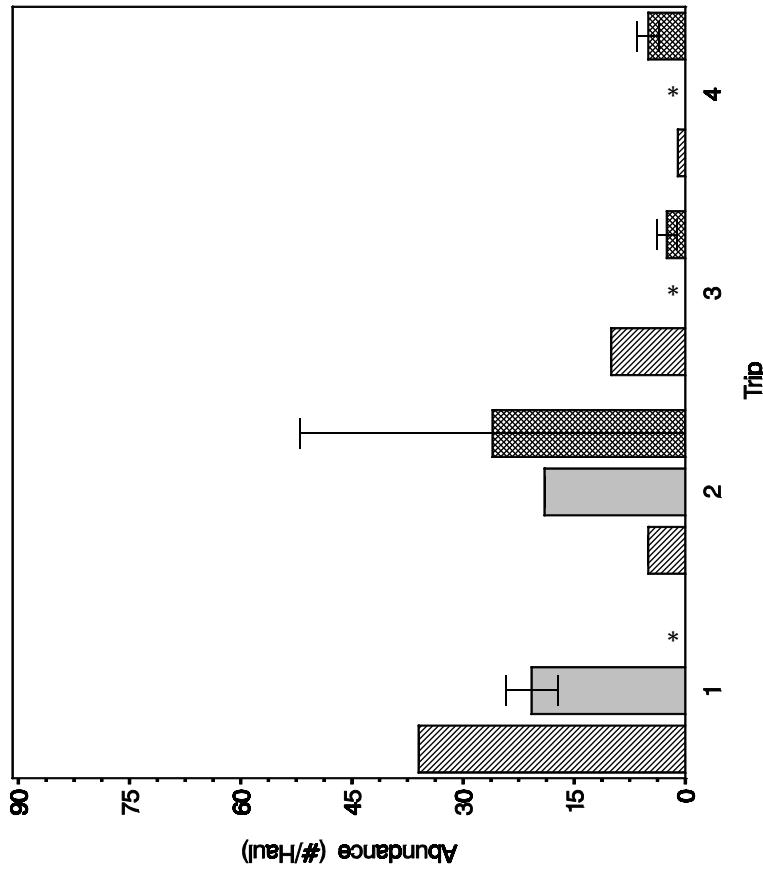


Figure KI-4. Mean and associated standard error of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) for all trips during the fall sampling period; * indicates that no stations were available for sampling in that category.

Table KI-3. Mean (\bar{x}_i) and associated standard error (SE) of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Oak Island, NC) and reference stations (Holden Beach, NC) by trip (i) during the fall sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	36.00		1	20.75	3.52	4			0			0.58
2	5.00		1	19.00		1	26.00		3	1.37	5.20	3.80
3	10.00		1			0	2.50	1.32	4		0.25	
4	1.00		1			0	5.00	1.47	4		5.00	
Fall	13.00			19.88	2.31		11.17	9.39	0.56	0.86	1.53	

SITE: HOLDEN BEACH
SEASON: WINTER
PARAMETER: GULF KINGFISH ABUNDANCE
GEAR: SEINE

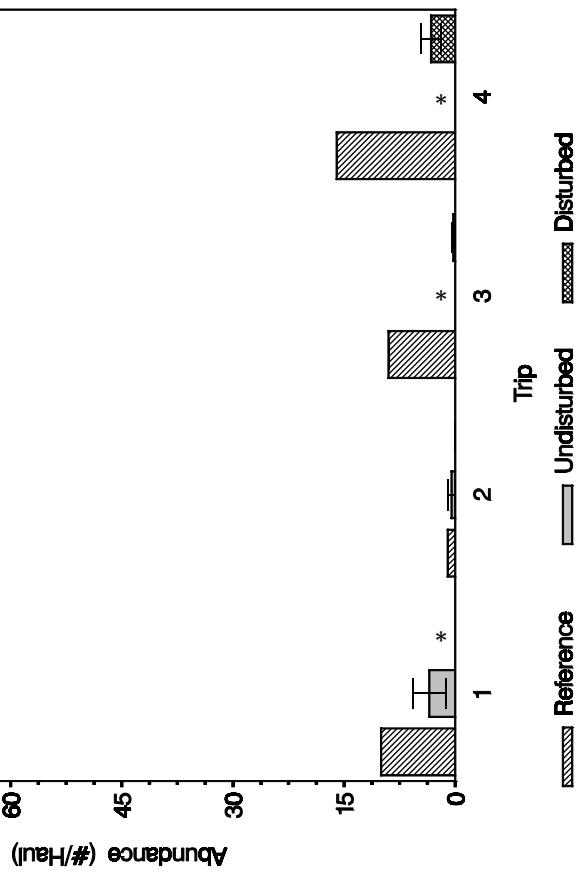


Figure KI-5. Mean and associated standard error of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) for all trips during the winter sampling period; * indicates that no stations were available for sampling in that category.

Table KI-4. Mean (\bar{x}_i) and associated standard error (SE) of Gulf kingfish abundance caught by seine at the disturbed and undisturbed stations (Holden Beach, NC) and reference stations (Holden Beach, NC) by trip (i) during the winter sampling period. Ratios of the means between disturbed and undisturbed stations (R_{du}), disturbed and reference stations (R_{dr}), and undisturbed and reference stations (R_{ur}) are in the last three columns.

Trip (i)	Reference				Undisturbed				Disturbed			
	\bar{x}_i	SE	N	\bar{x}_i	SE	N	\bar{x}_i	SE	N	R_{du}	R_{dr}	R_{ur}
1	10.00		1	3.50	2.25	4			0			0.35
2	1.00		1	0.50	0.50	2	0.00	0.00	2	0.00	0.00	0.50
3	9.00		1			0	0.25	0.25	4		0.03	
4	16.00		1			0	3.25	1.31	4		0.20	
Winter	9.00			2.00	1.41		1.17	1.00		0.58	0.13	0.22

Table KI-5. Gulf kingfish abundance interval estimates (90% confidence level) for differences between categories of seine stations. The null hypothesis of equal means between two categories is rejected when the confidence interval (CL_{Lower} , CL_{Upper}) does not contain 0. Shaded values are statistically significant.

Season	Reference vs Undisturbed*		Reference vs Disturbed*		Undisturbed vs Disturbed*	
	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}	CL_{Lower}	CL_{Upper}
Spring	-0.95	0.11	-2.51	-0.38	-2.22	0.16
Summer						
Fall					-7.24	24.66
Winter					-2.02	3.69
All	-10.09	-4.89	-15.56	15.20	-8.29	22.91

* If the confidence intervals are both negative, then the first station category is significantly lower than the second category. If they are both positive then the first station category is significantly higher.

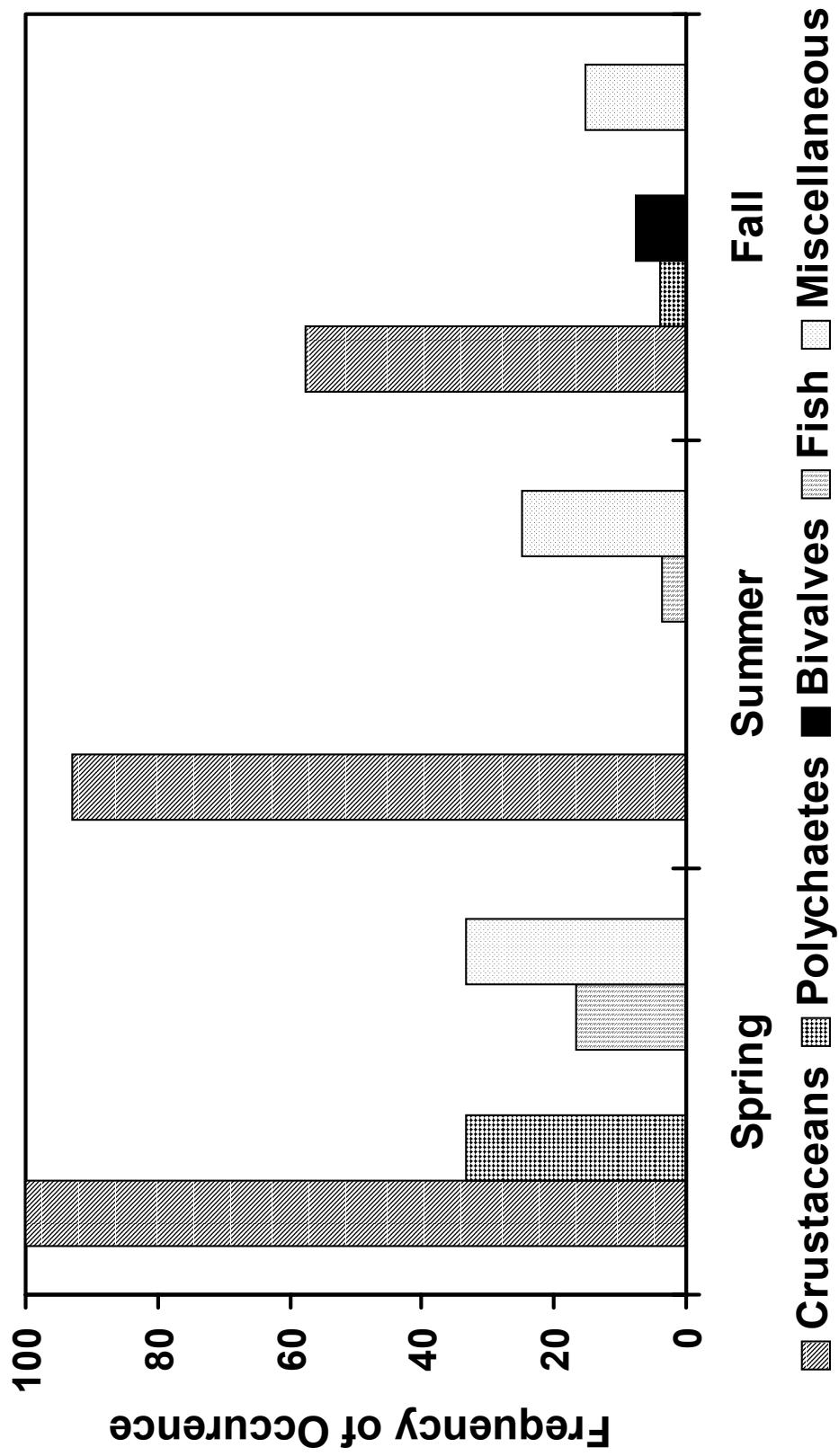


Figure KI-6. Stomach contents of Gulf Kingfish collected by seine at Brunswick County, NC beaches during 2001.

TURBIDITY

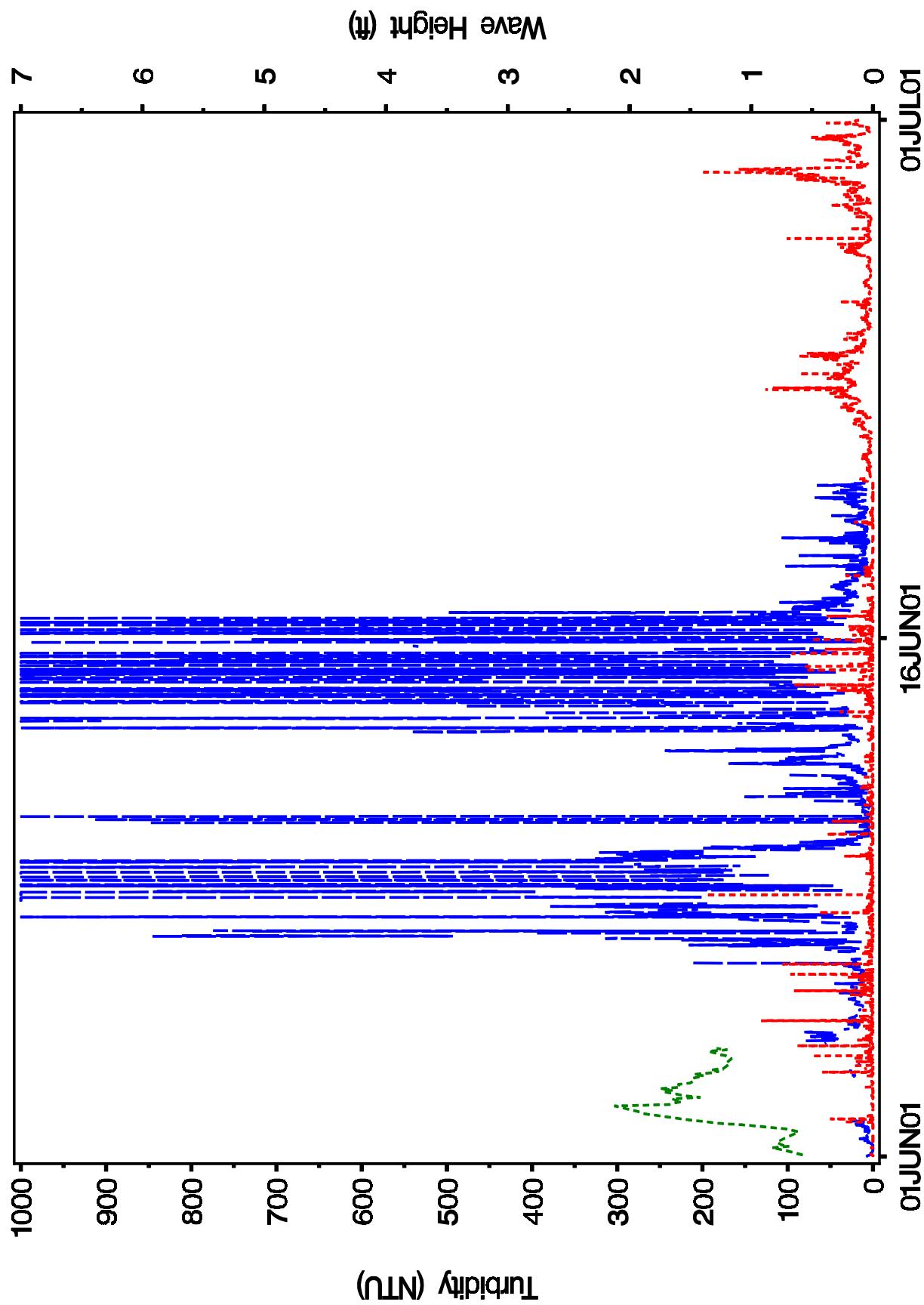


Figure TU-1. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during June 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

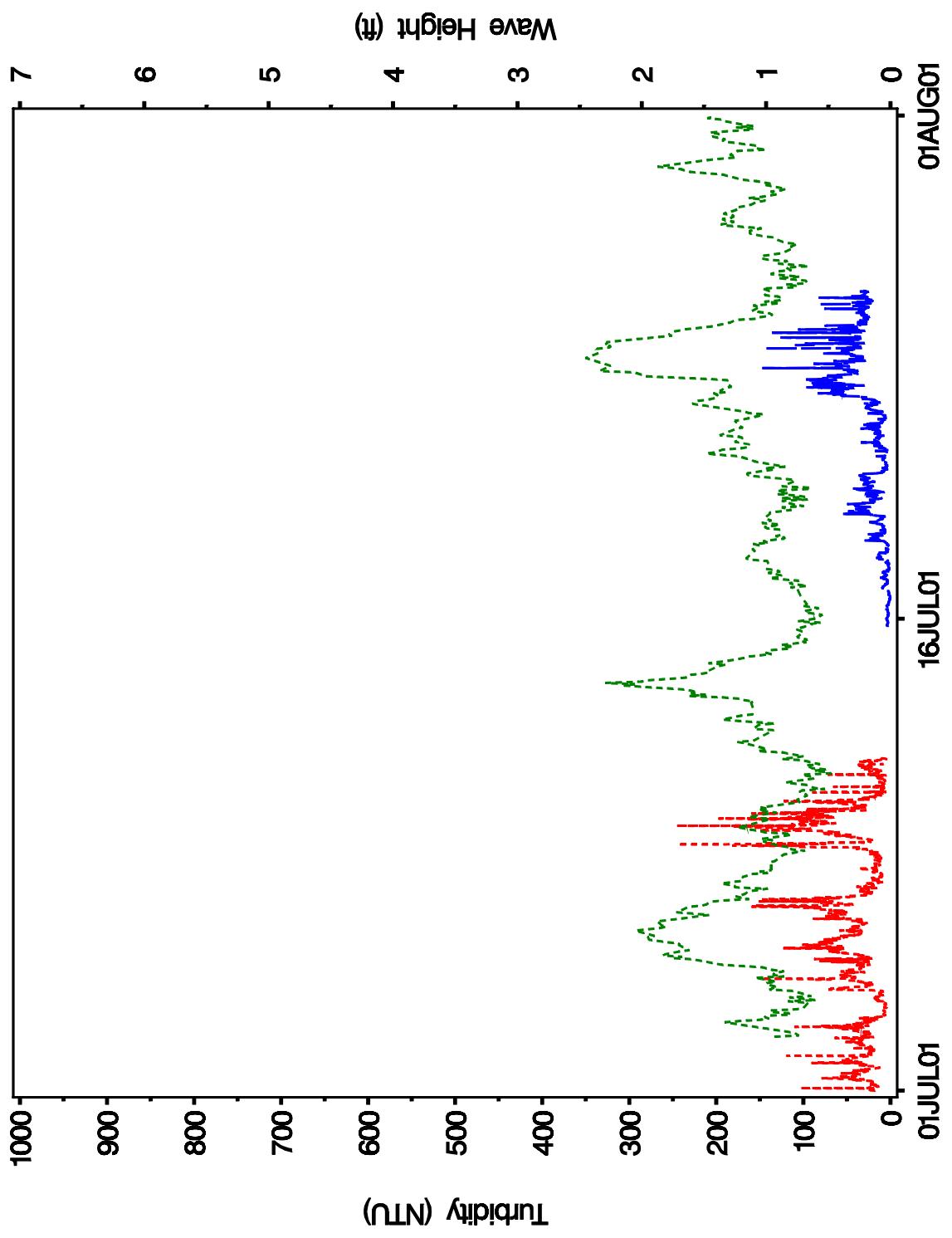


Figure TU-2. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during July 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

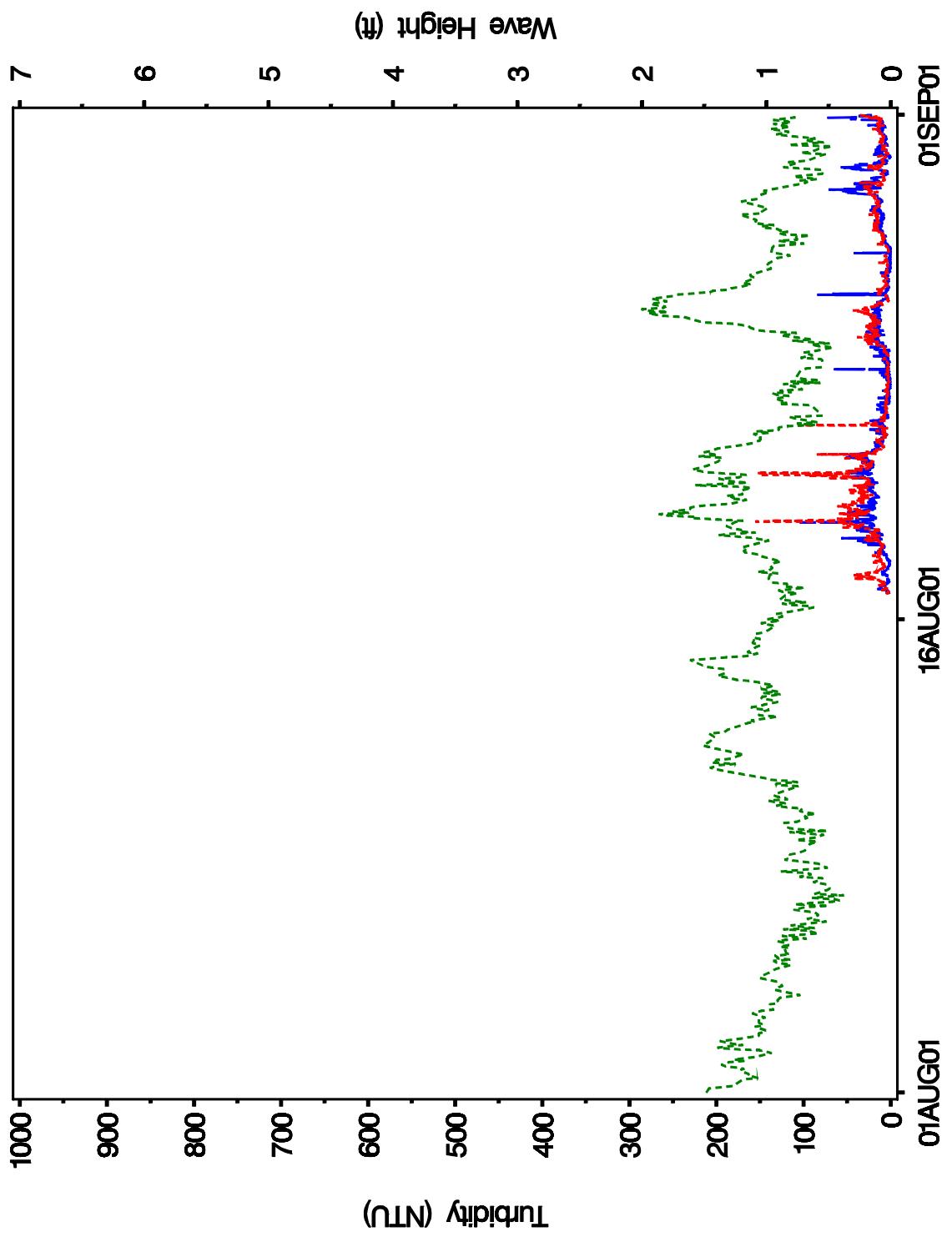


Figure TU-3. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during August 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

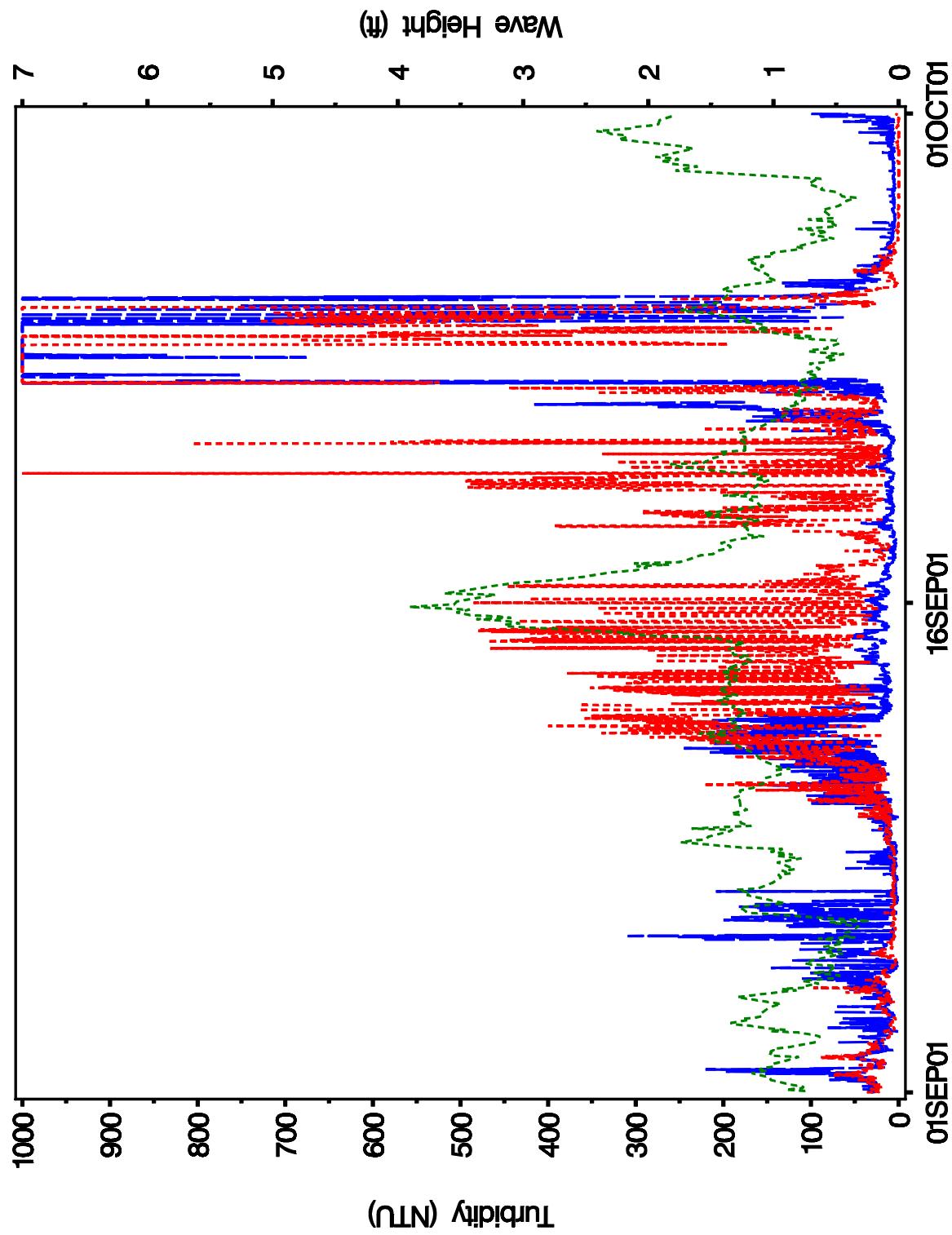


Figure TU-4. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during September 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

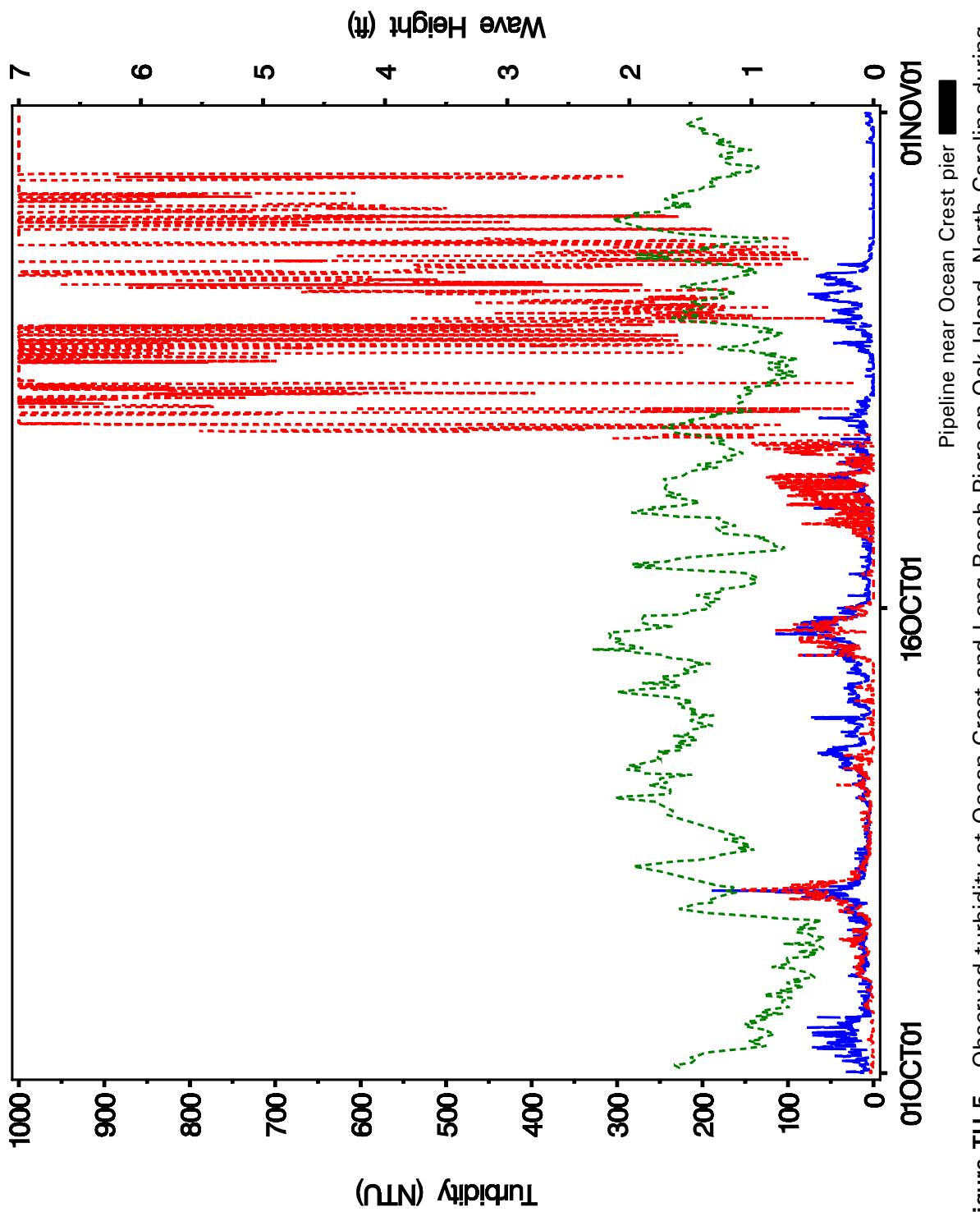


Figure TU-5. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during October 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

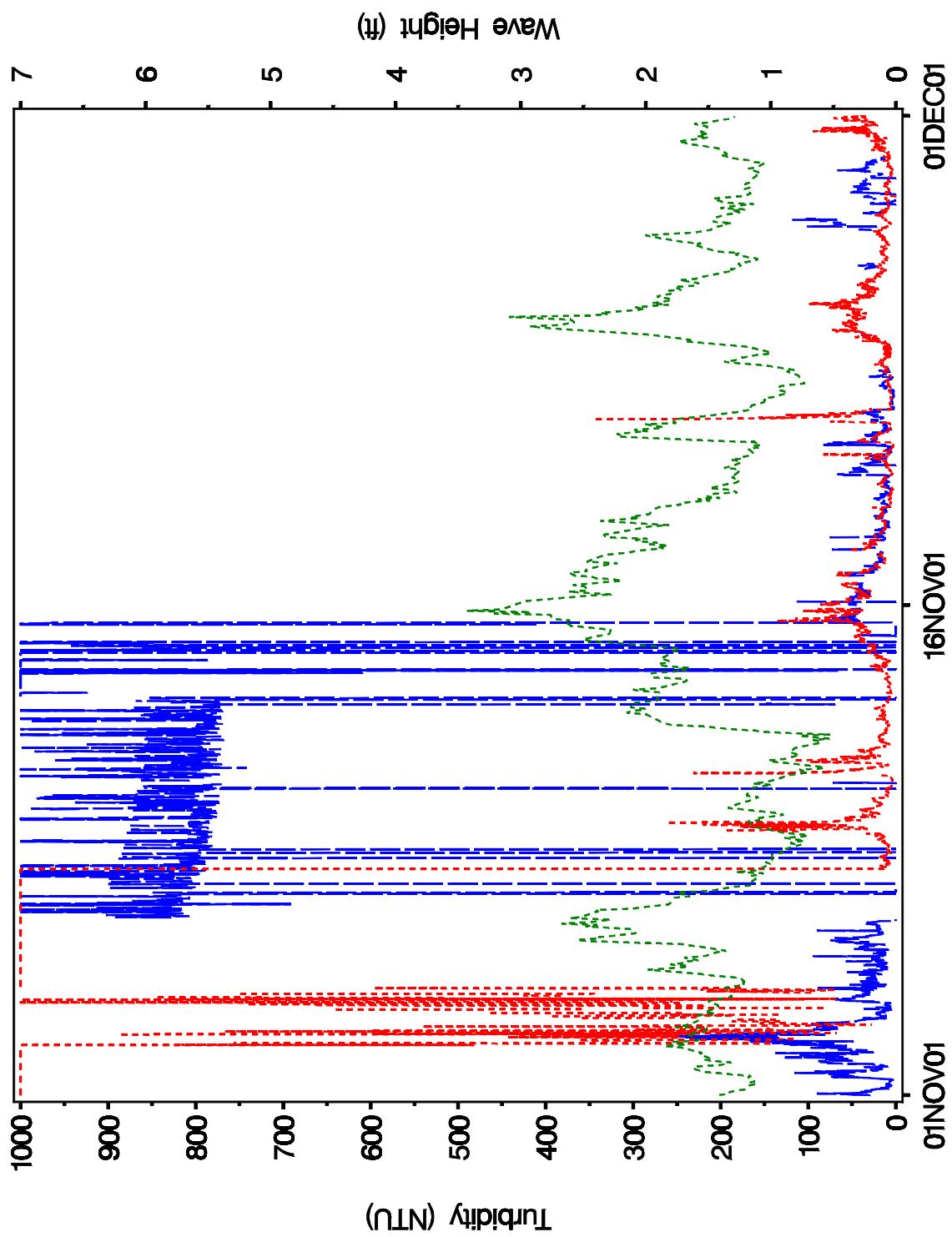


Figure TU-6. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during November 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

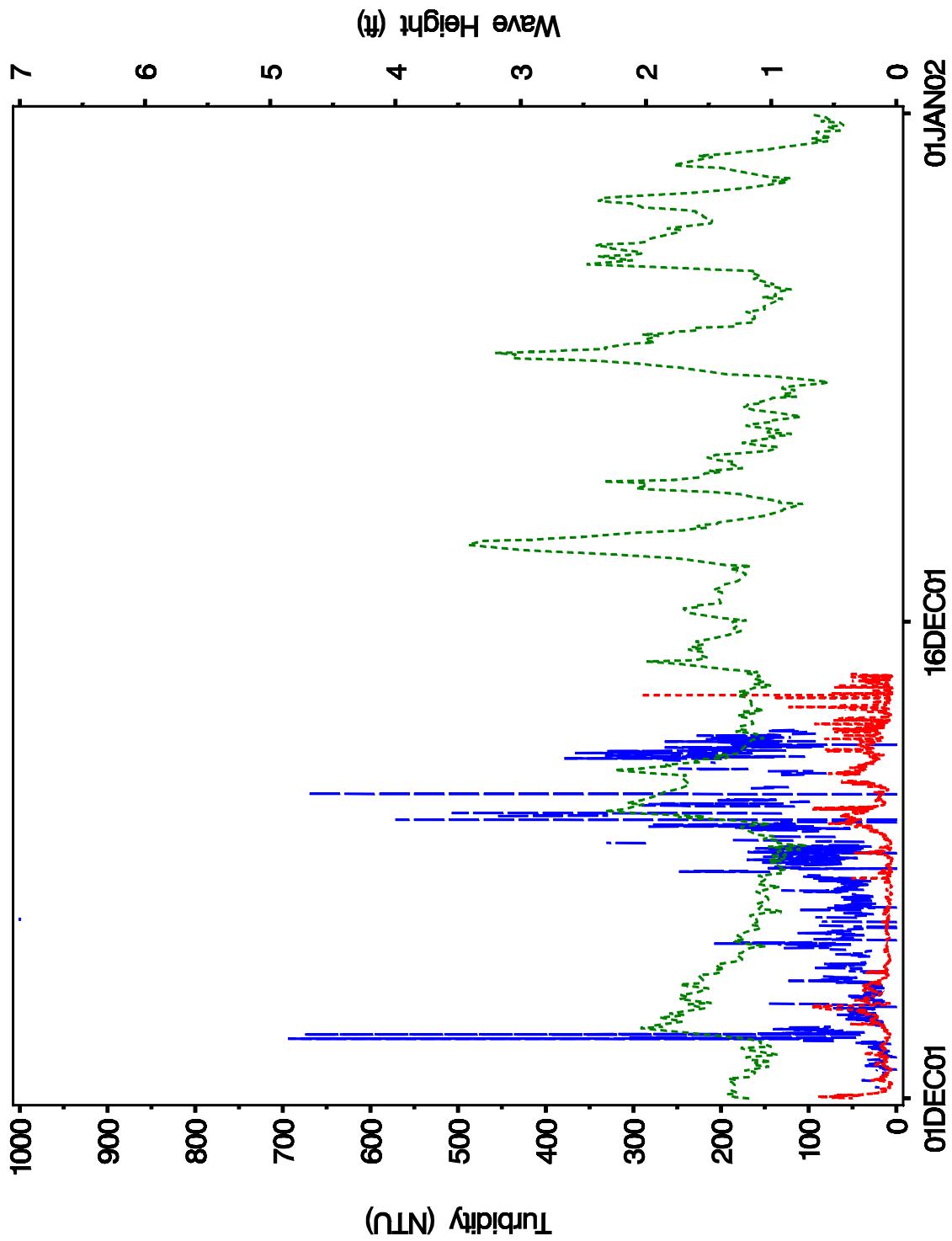


Figure TU-7. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during December 2001. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

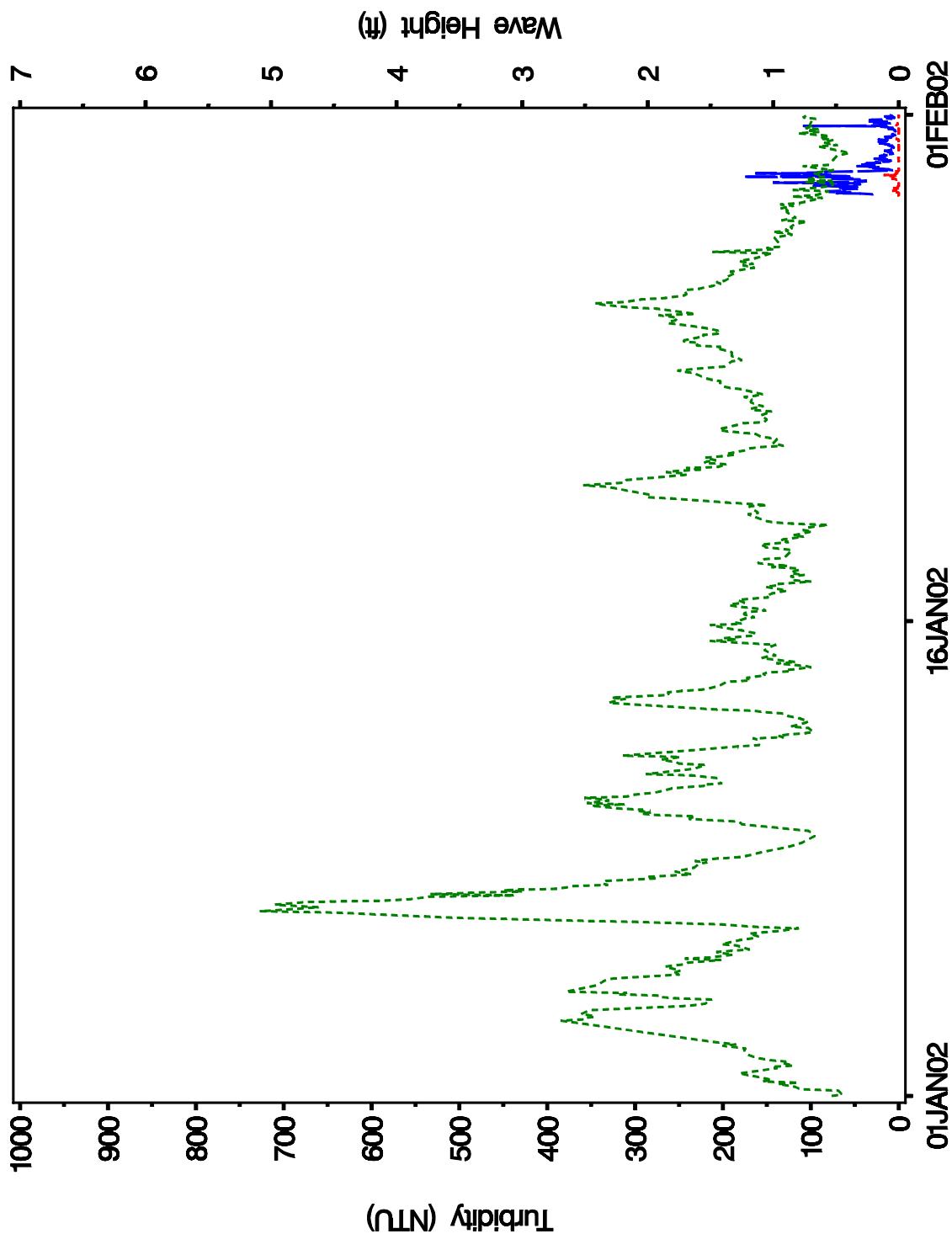


Figure TU-8. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during January 2002. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

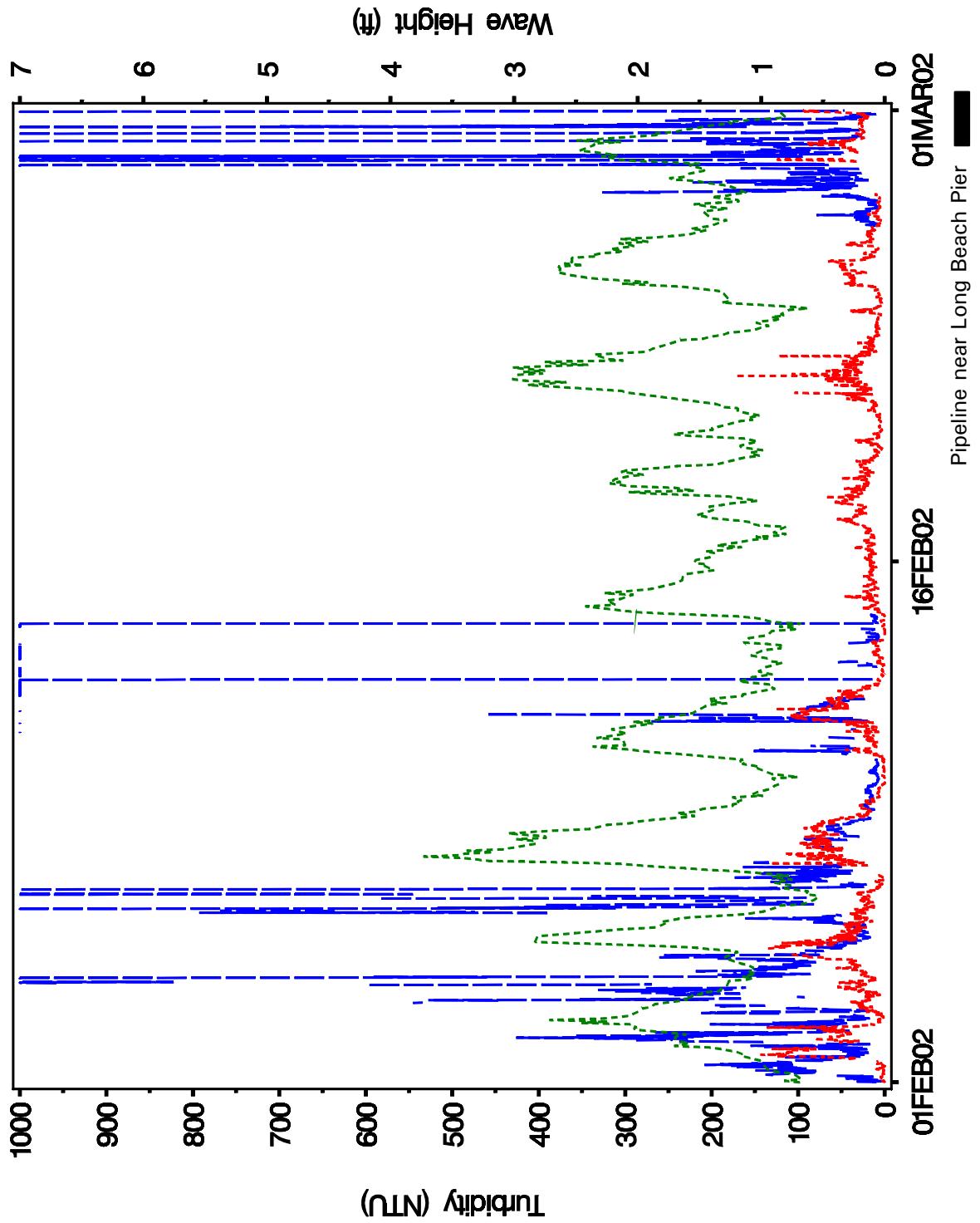


Figure TU-9. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during February 2002. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

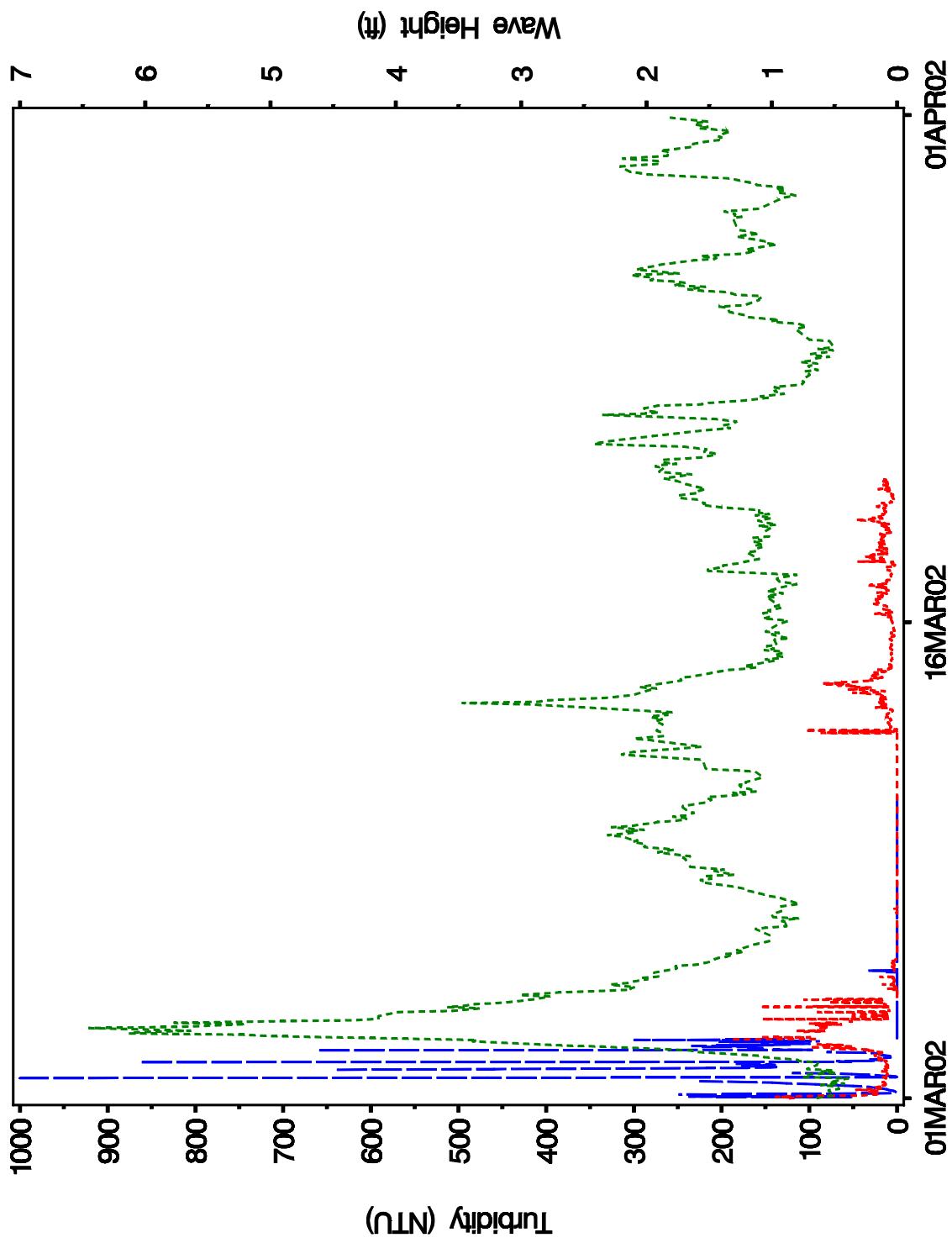


Figure TU-10. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during March 2002. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

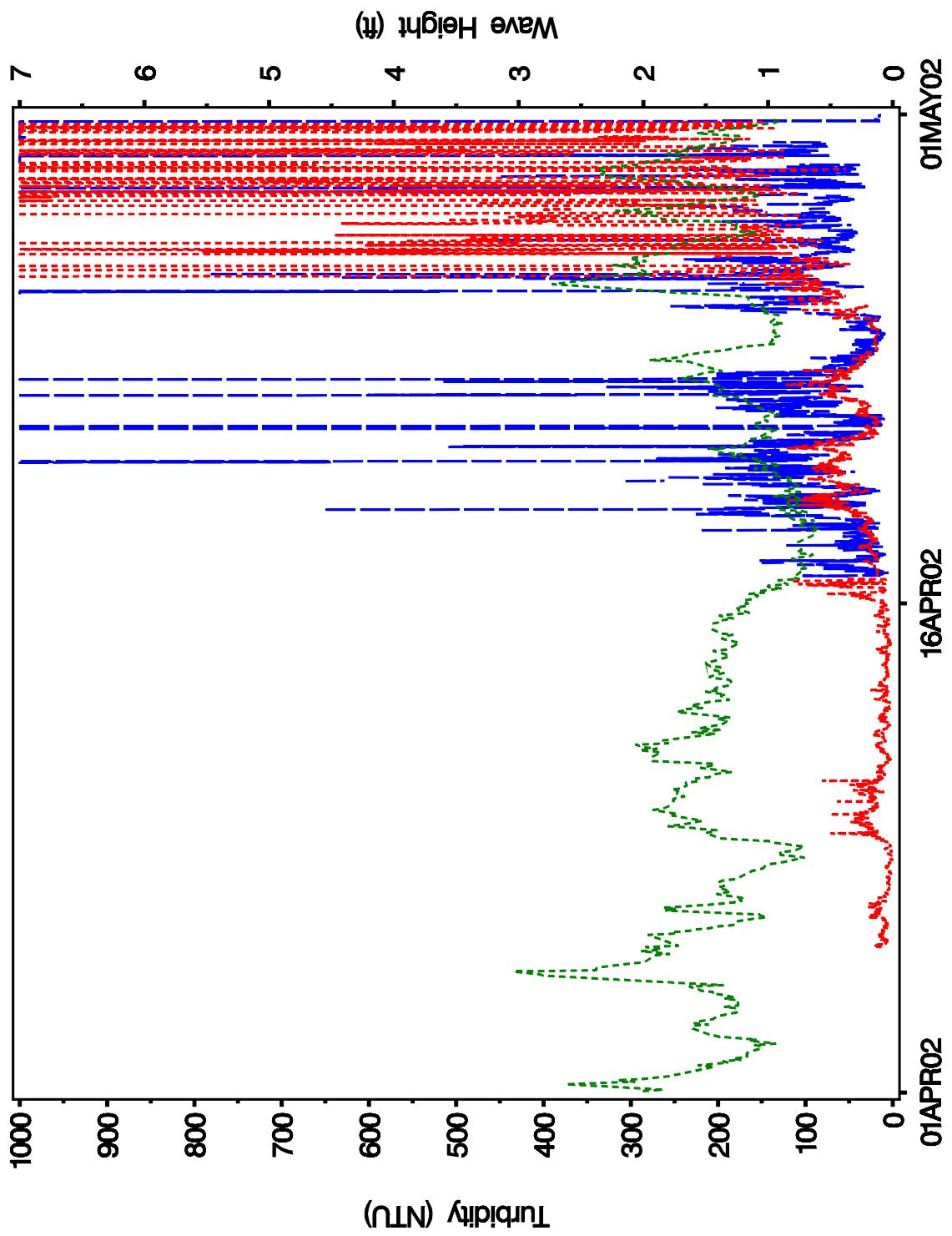


Figure TU-11. Observed turbidity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during April 2002. Long Beach represented in blue. Ocean Crest represented in red. Wave height represented in green.

TEMPERATURE

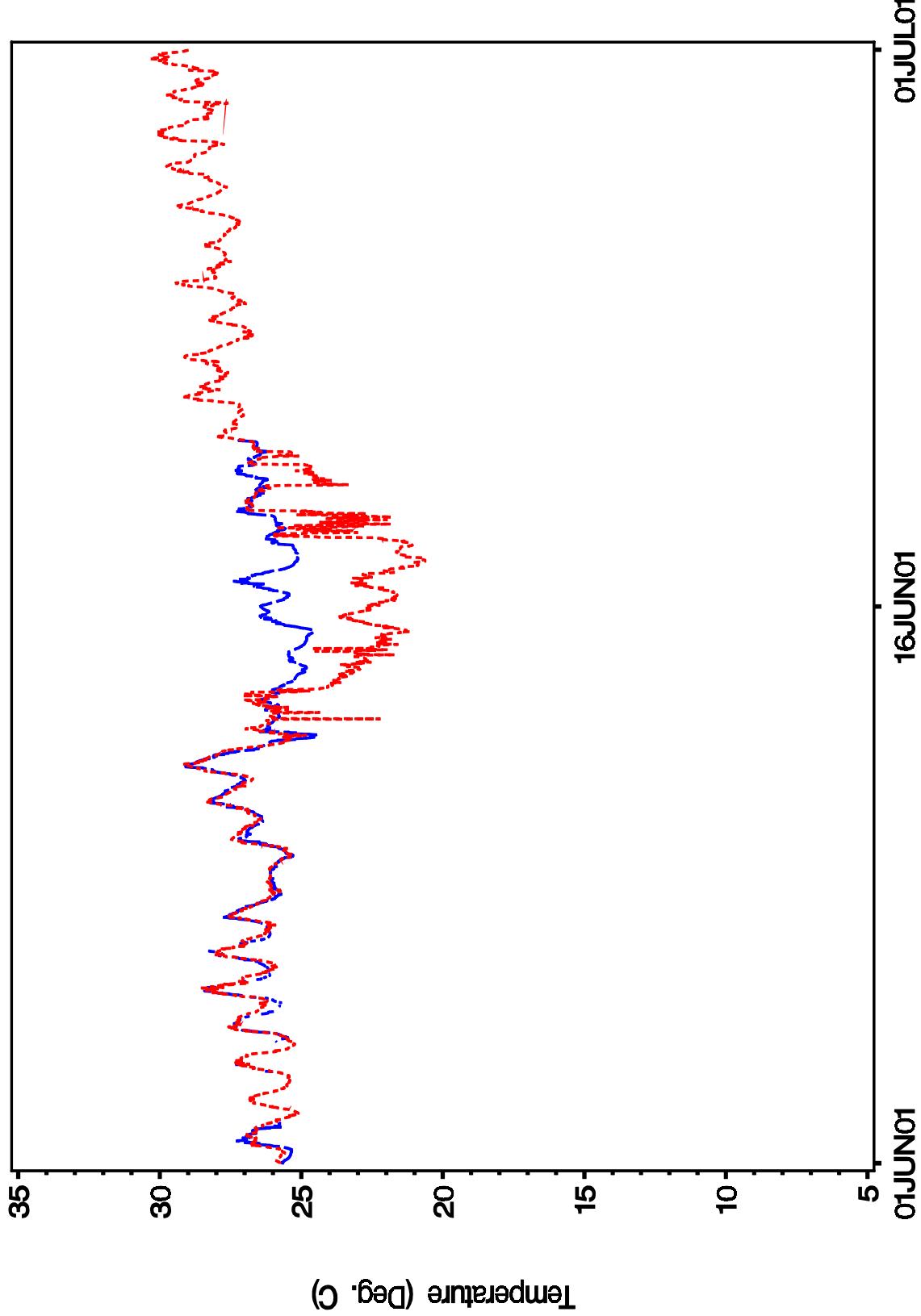


Figure TE-1. Observed temperature at Ocean Crest and Long Beach piers on Oak Island, North Carolina during June 2001. Long Beach represented in blue. Ocean Crest represented in red.

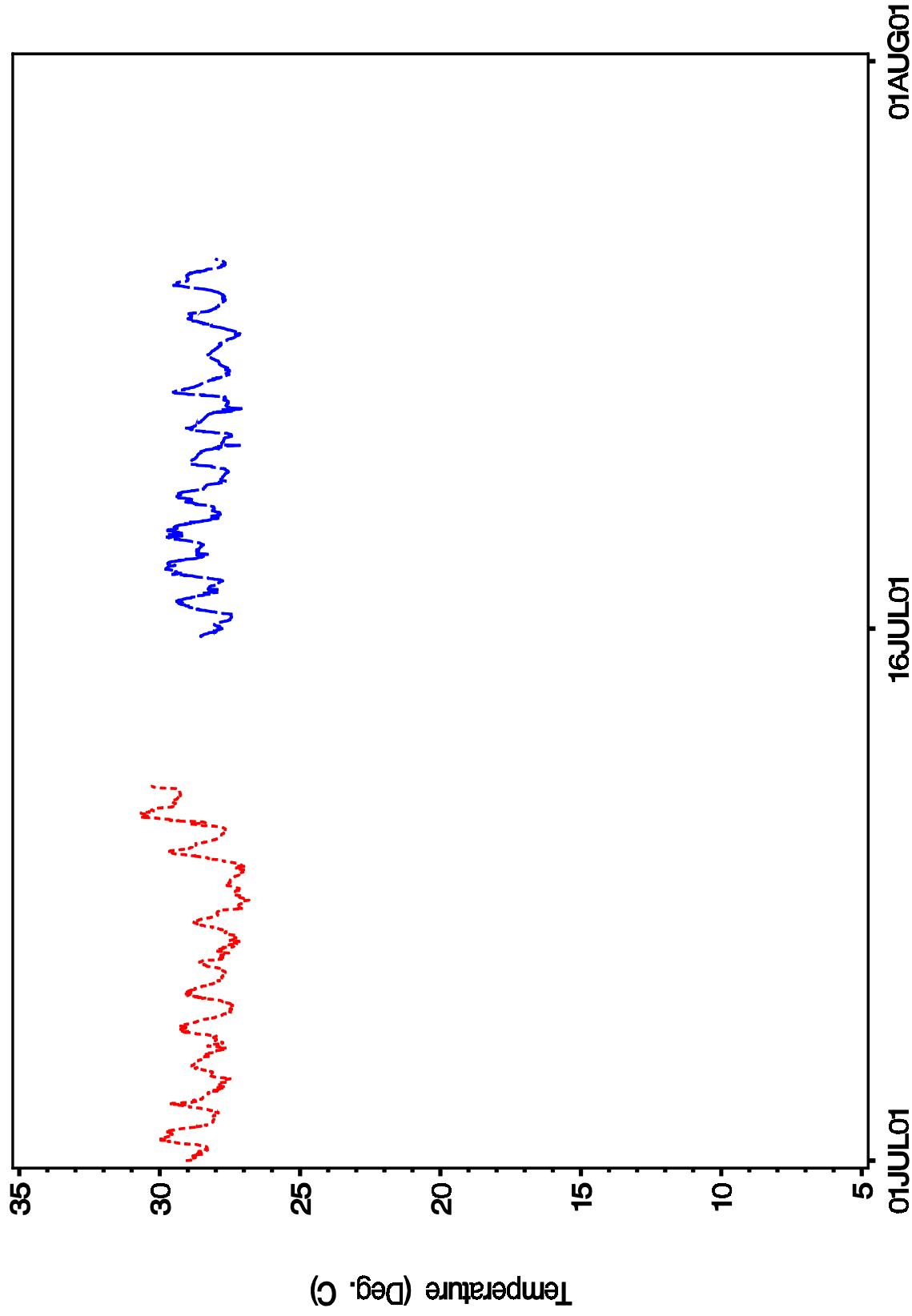


Figure TE-2. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during July 2001. Long Beach represented in blue. Ocean Crest represented in red.

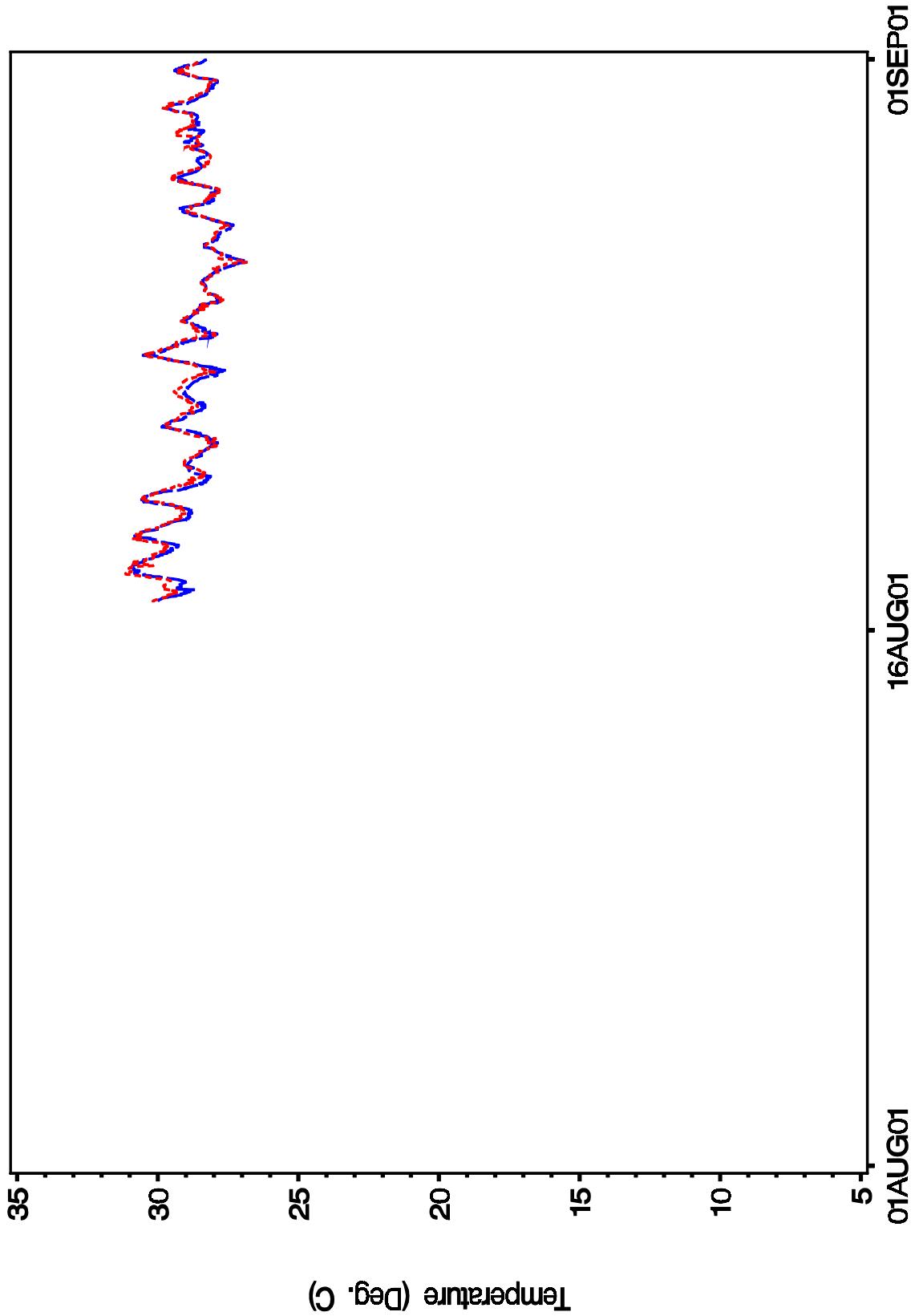


Figure TE-3. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during August 2001. Long Beach represented in blue. Ocean Crest represented in red.

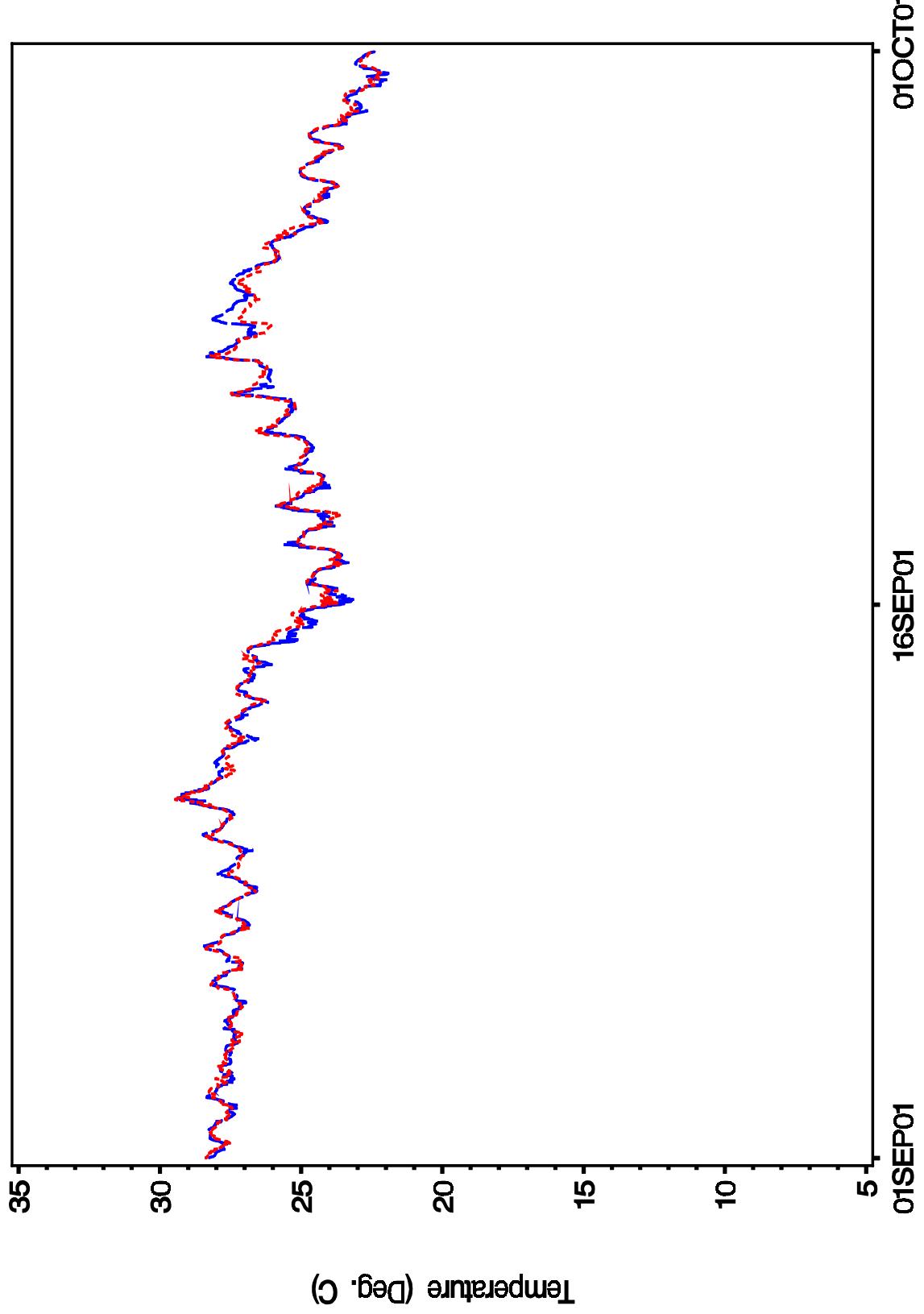


Figure TE-4. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during September 2001. Long Beach represented in blue. Ocean Crest represented in red.

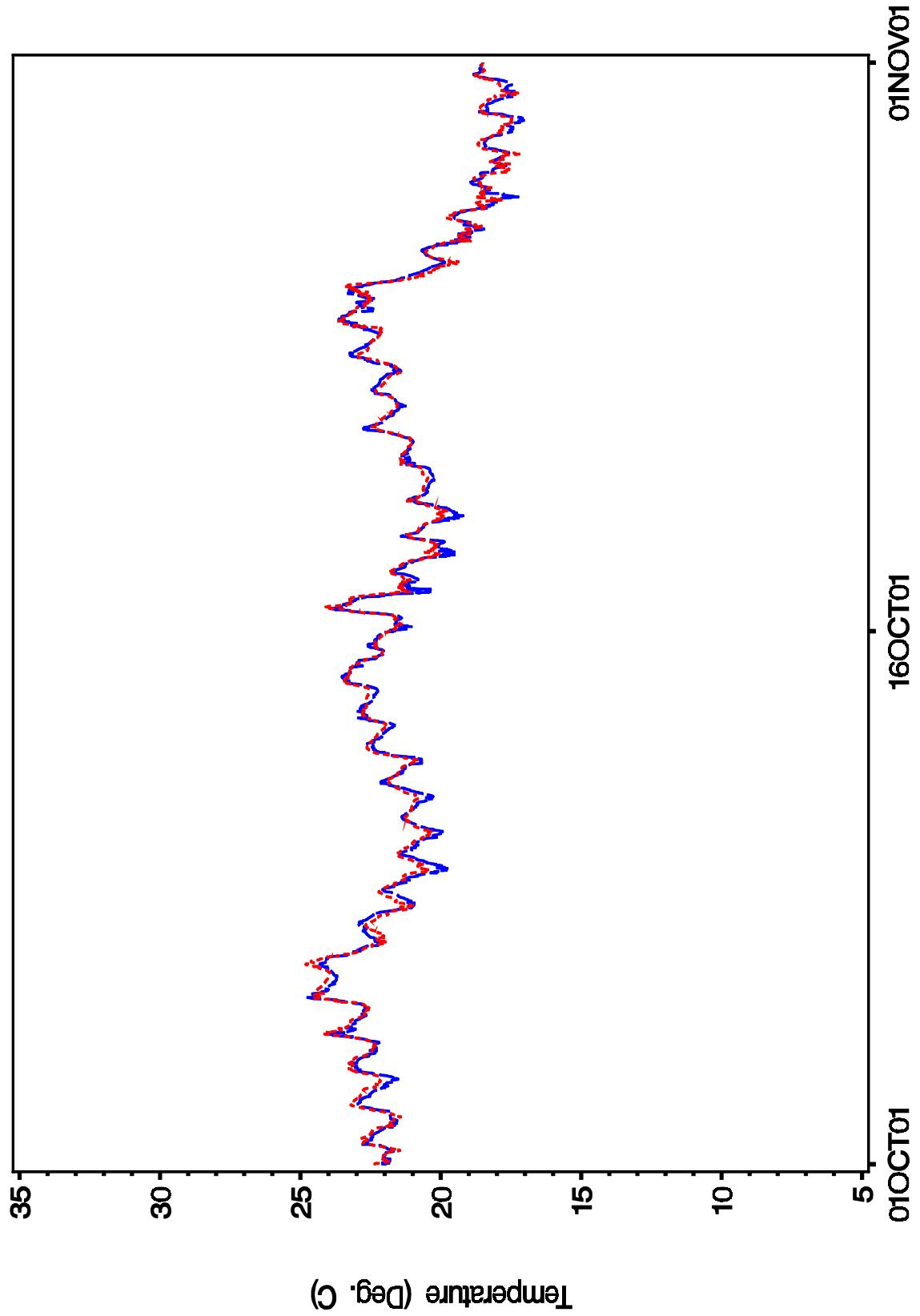


Figure TE-5. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during October 2001. Long Beach represented in blue. Ocean Crest represented in red.

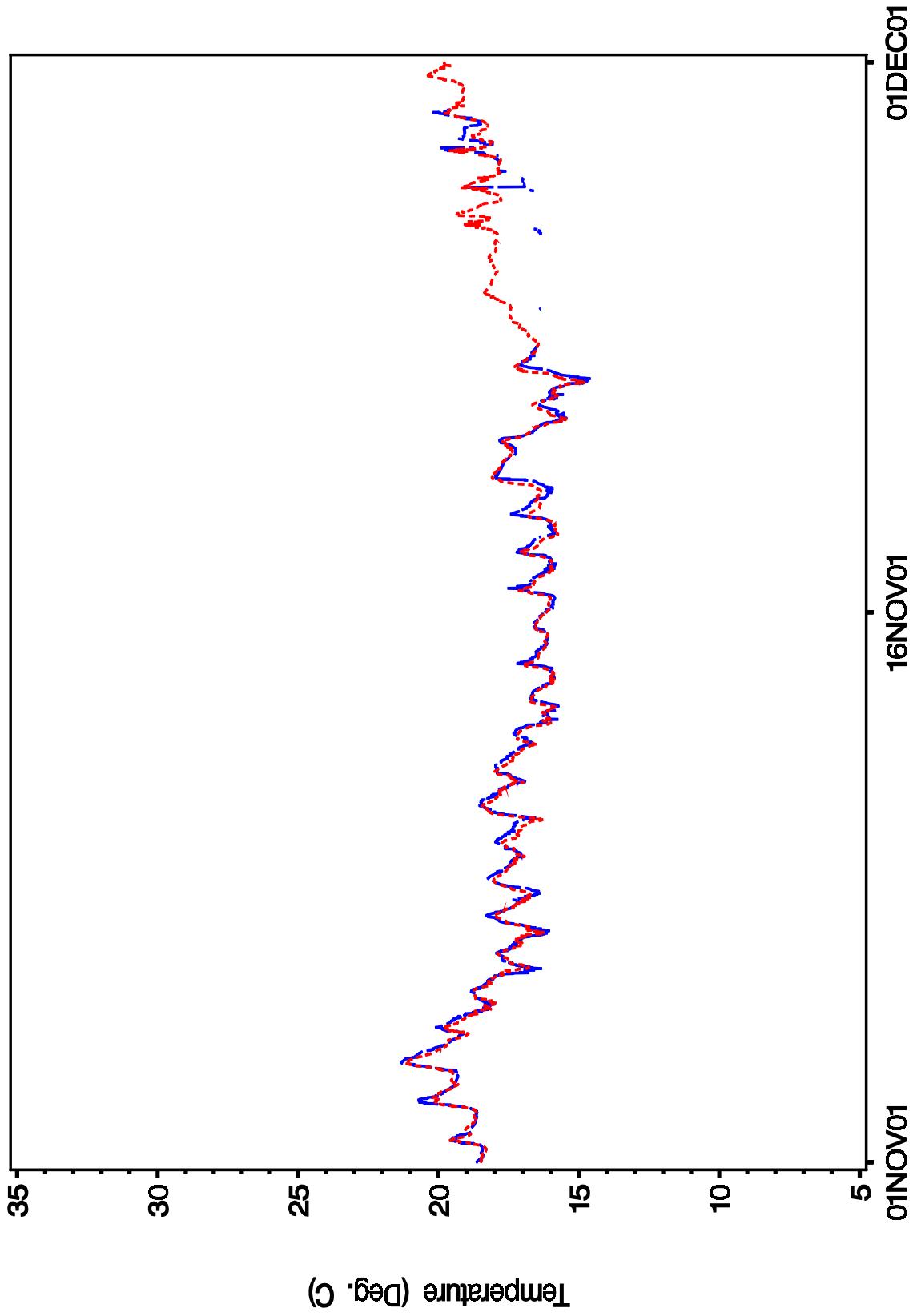


Figure TE-6. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during November 2001. Long Beach represented in blue. Ocean Crest represented in red.

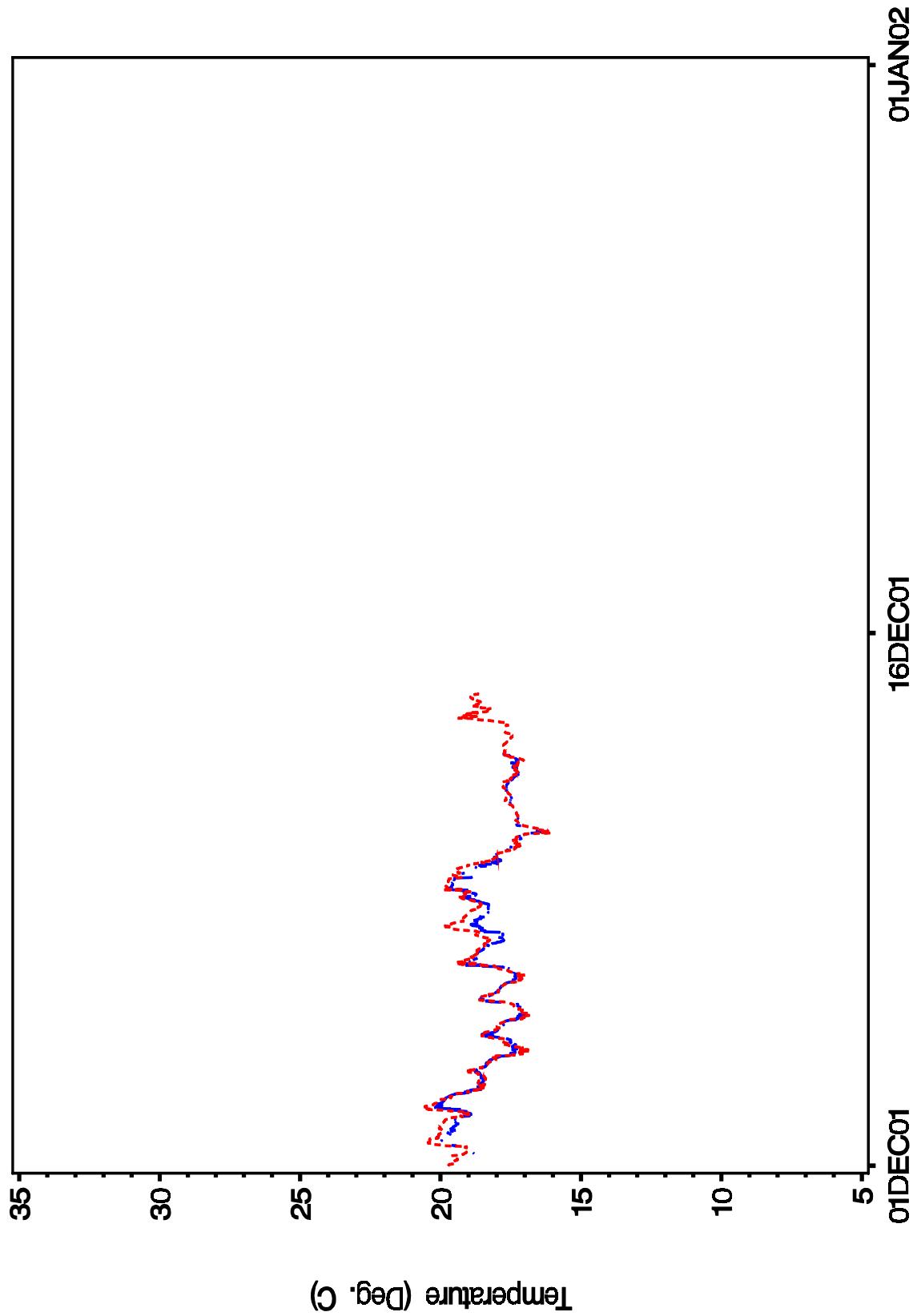


Figure TE-7. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during December 2001. Long Beach represented in blue. Ocean Crest represented in red.

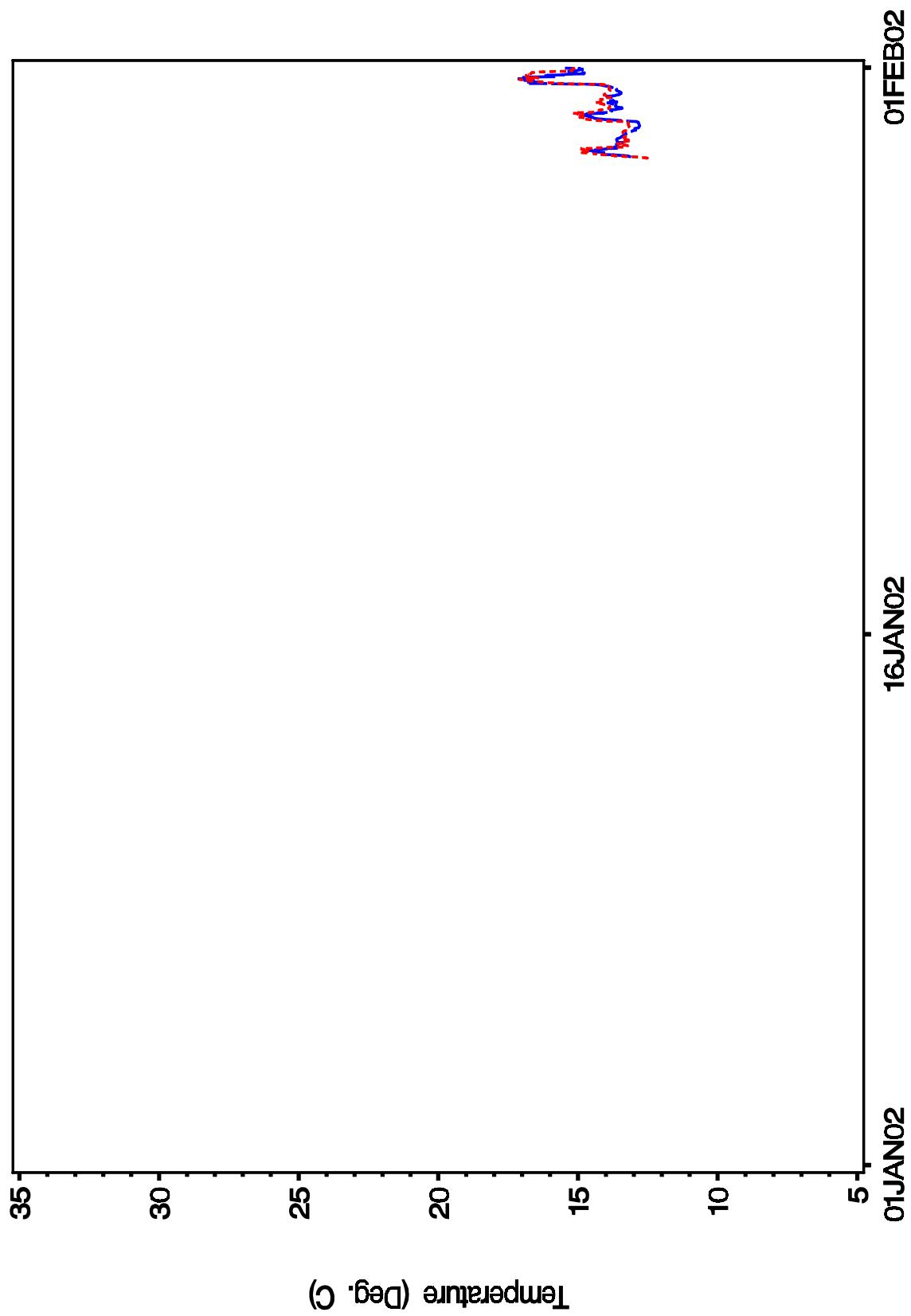


Figure TE-8. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during January 2002. Long Beach represented in blue. Ocean Crest represented in red.

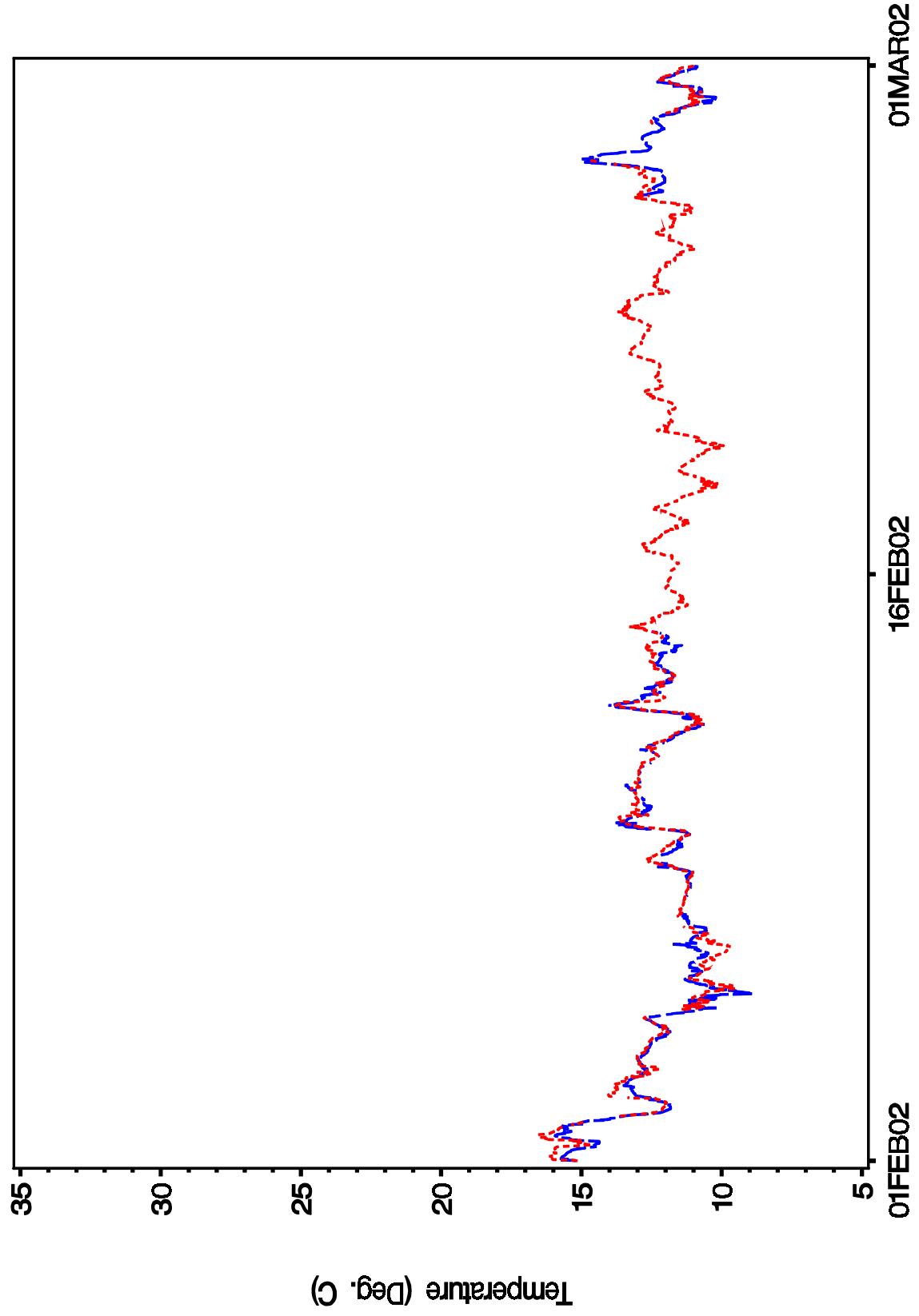


Figure TE-9. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during February 2002. Long Beach represented in blue. Ocean Crest represented in red.

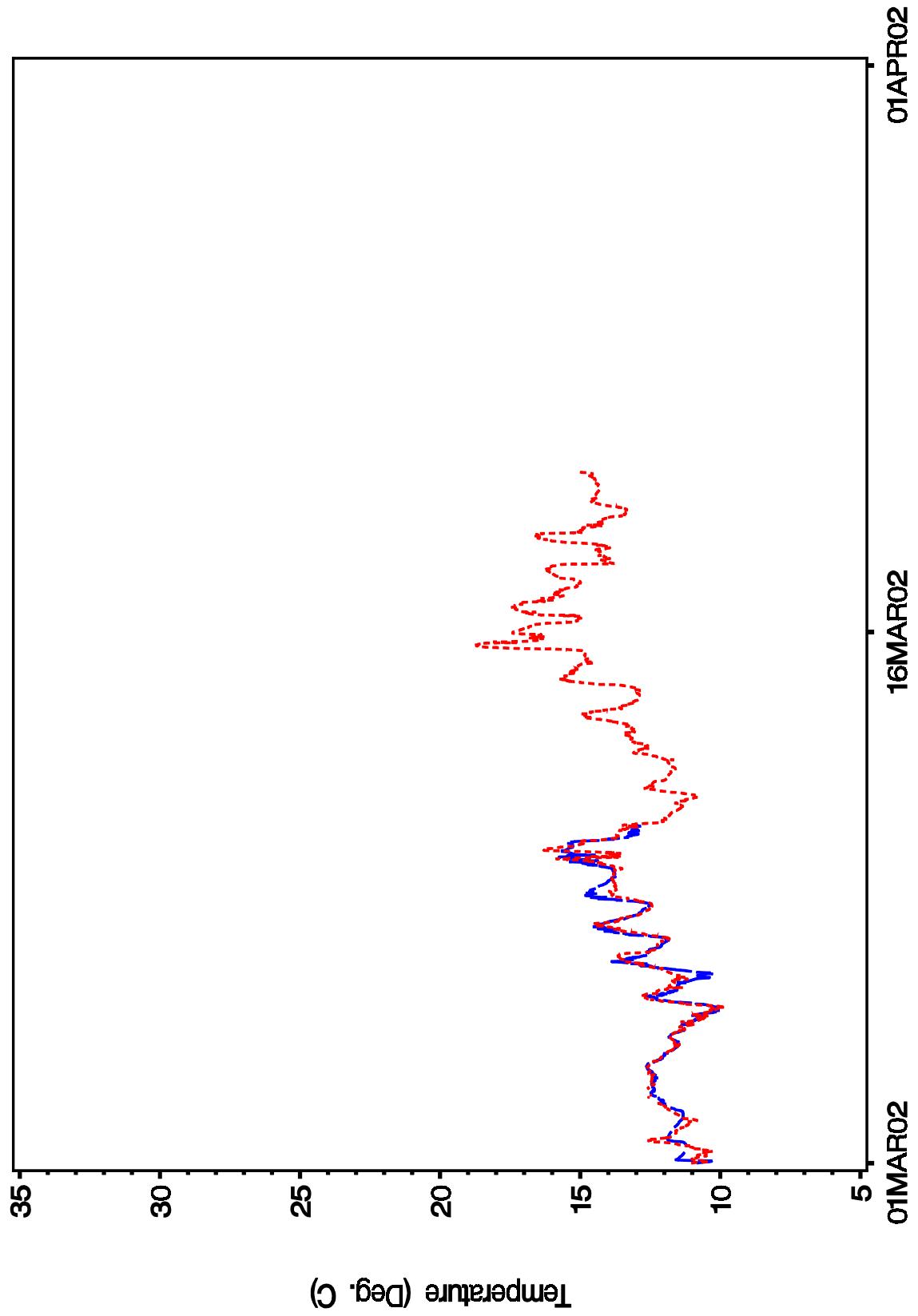


Figure TE-10. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during March 2002. Long Beach represented in blue. Ocean Crest represented in red.

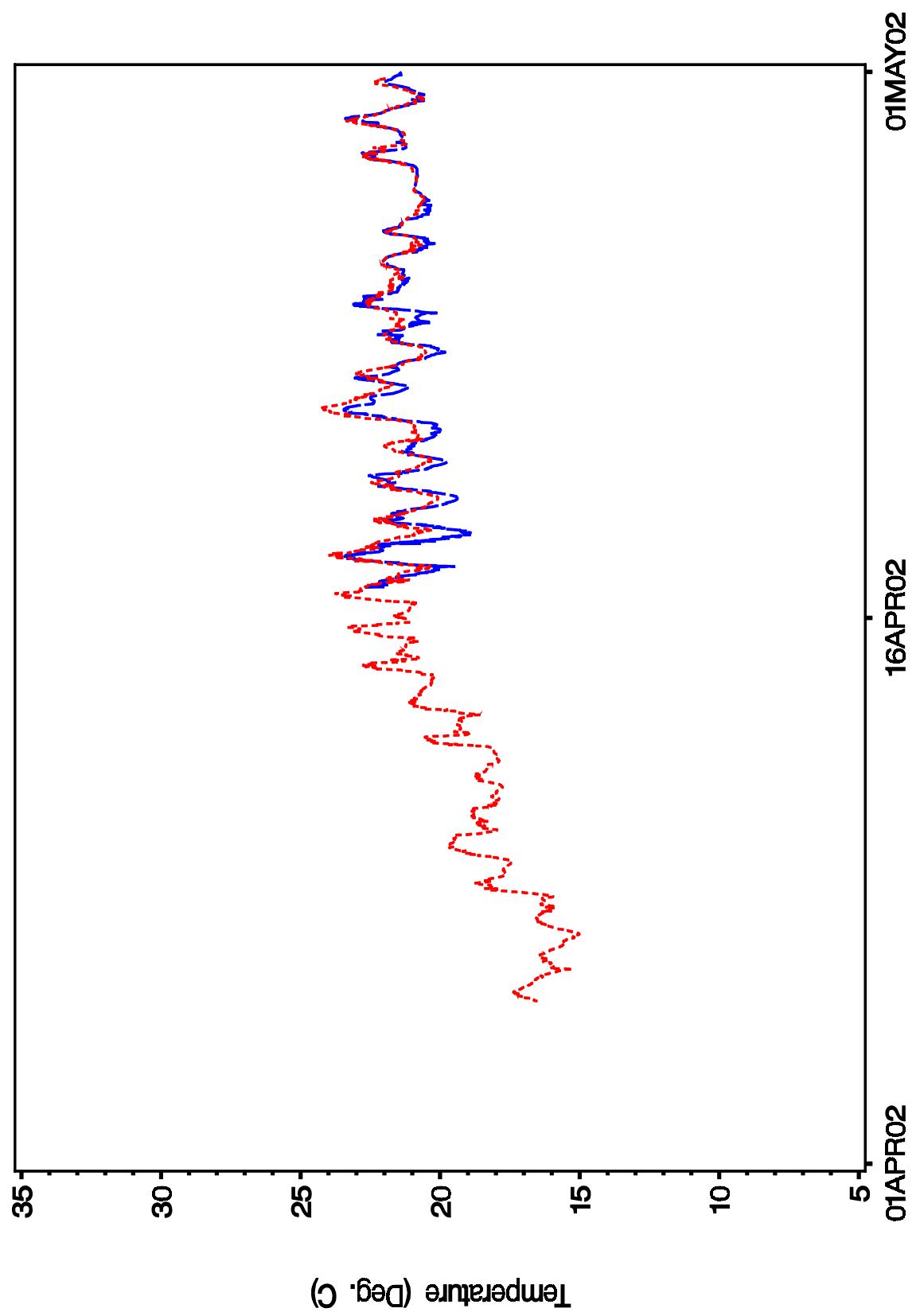


Figure TE-11. Observed temperature at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during April 2002. Long Beach represented in blue. Ocean Crest represented in red.

SALINITY

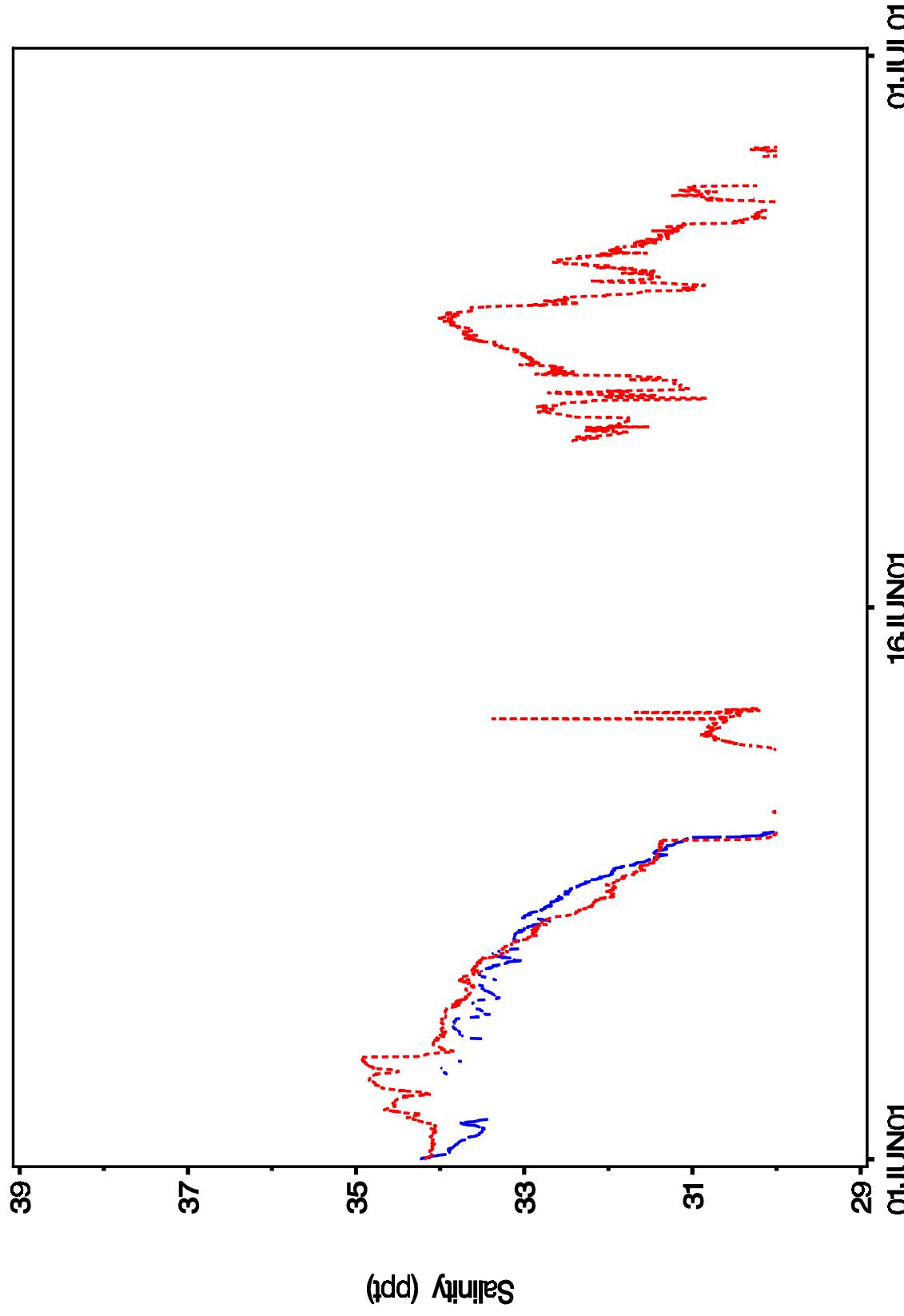


Figure SA-1. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during June 2001.
Long Beach represented in blue. Ocean Crest represented in red.

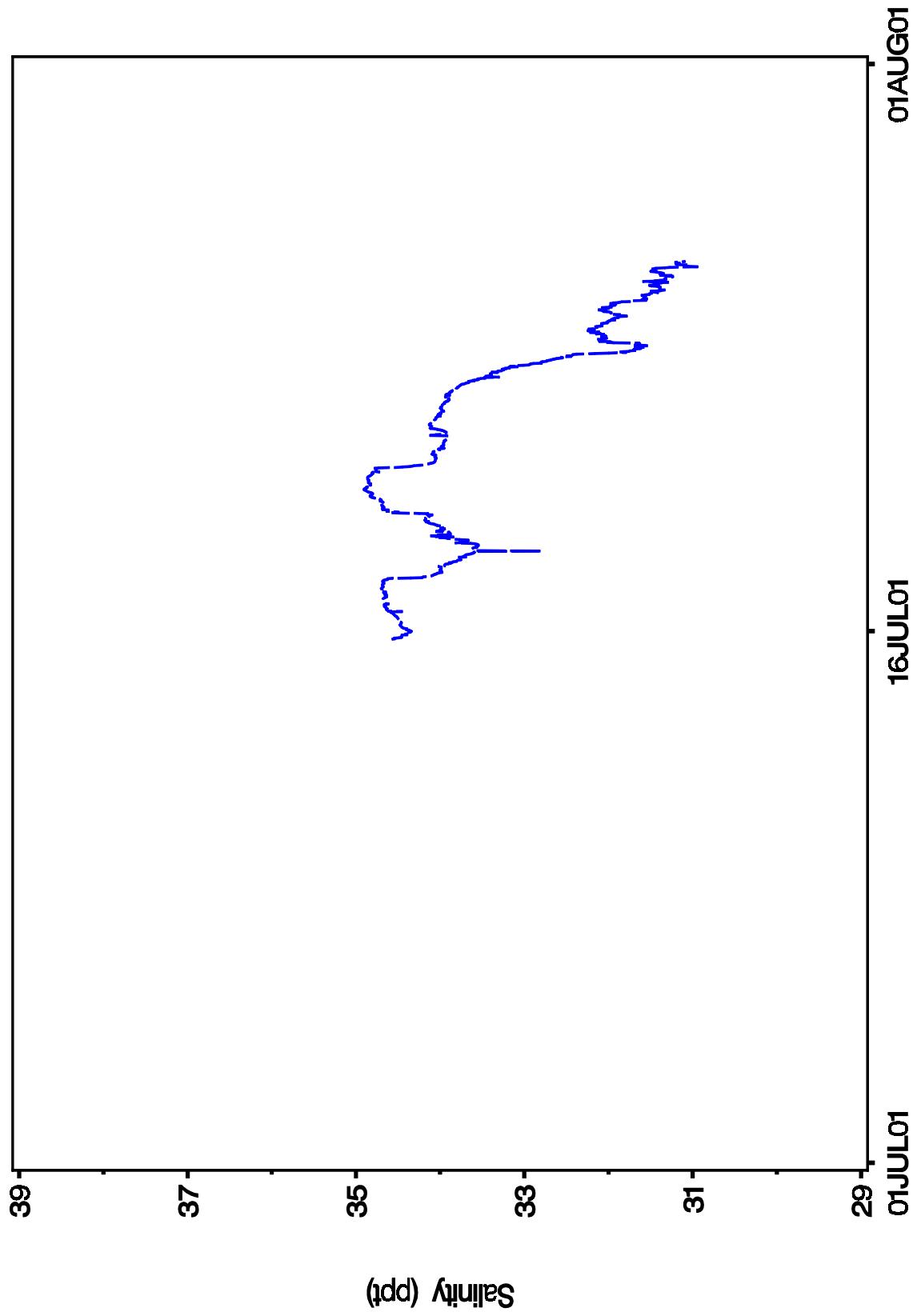


Figure SA-2. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during July 2001.
Long Beach represented in red. Ocean Crest represented in blue.

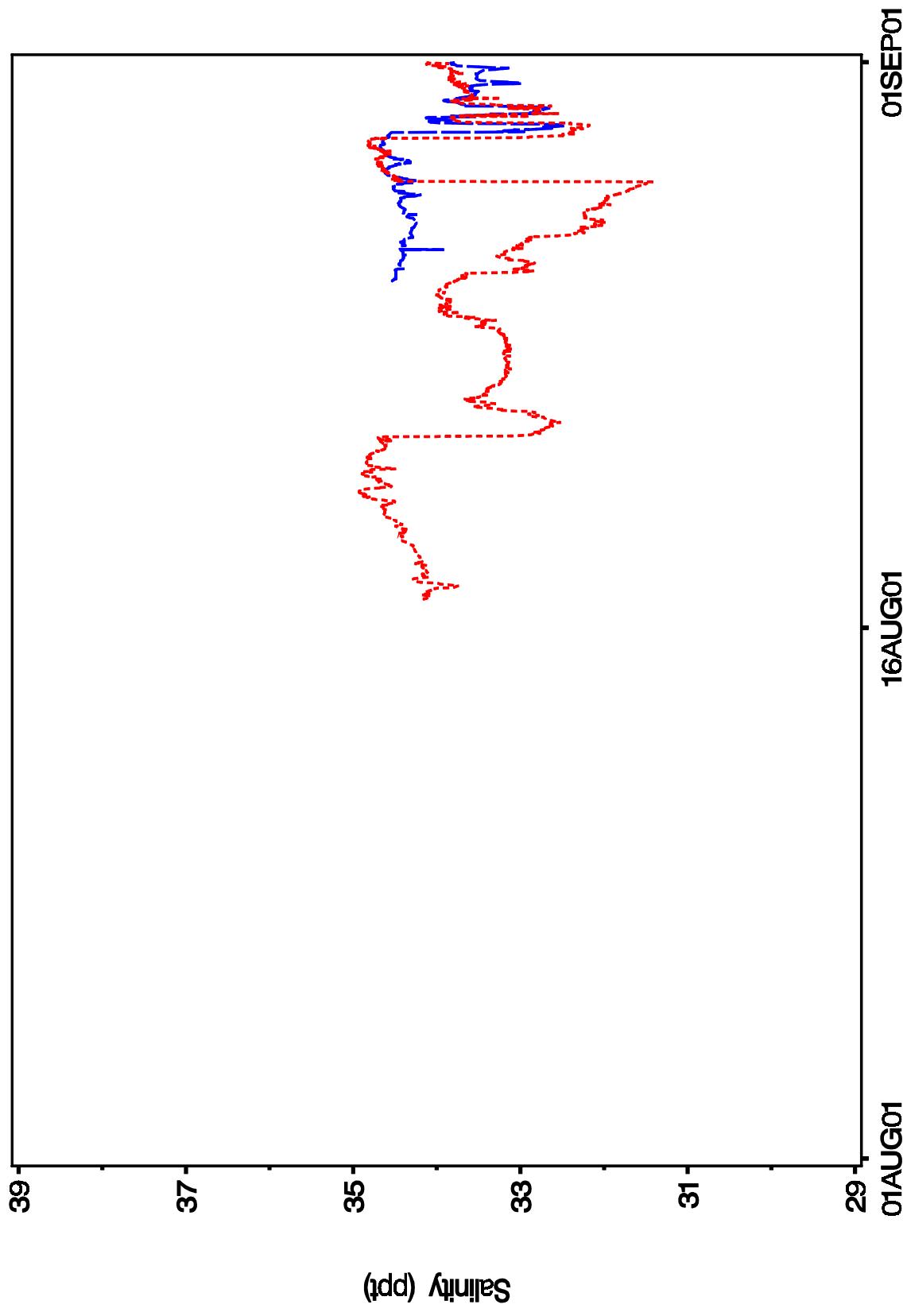


Figure SA-3. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during August 2001. Long Beach represented in blue. Ocean Crest represented in red.

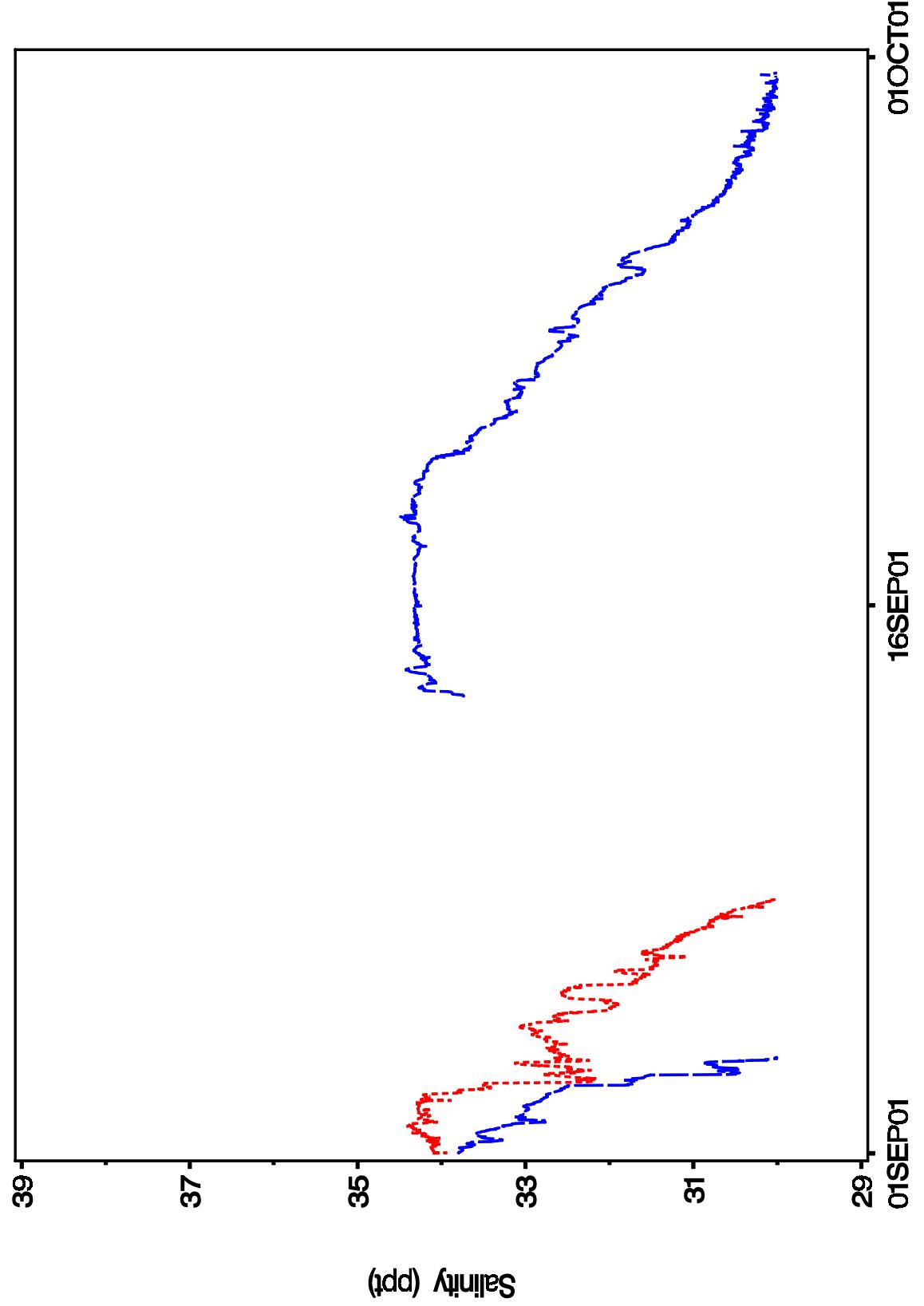


Figure SA-4. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during September 2001. Long Beach represented in blue. Ocean Crest represented in red.

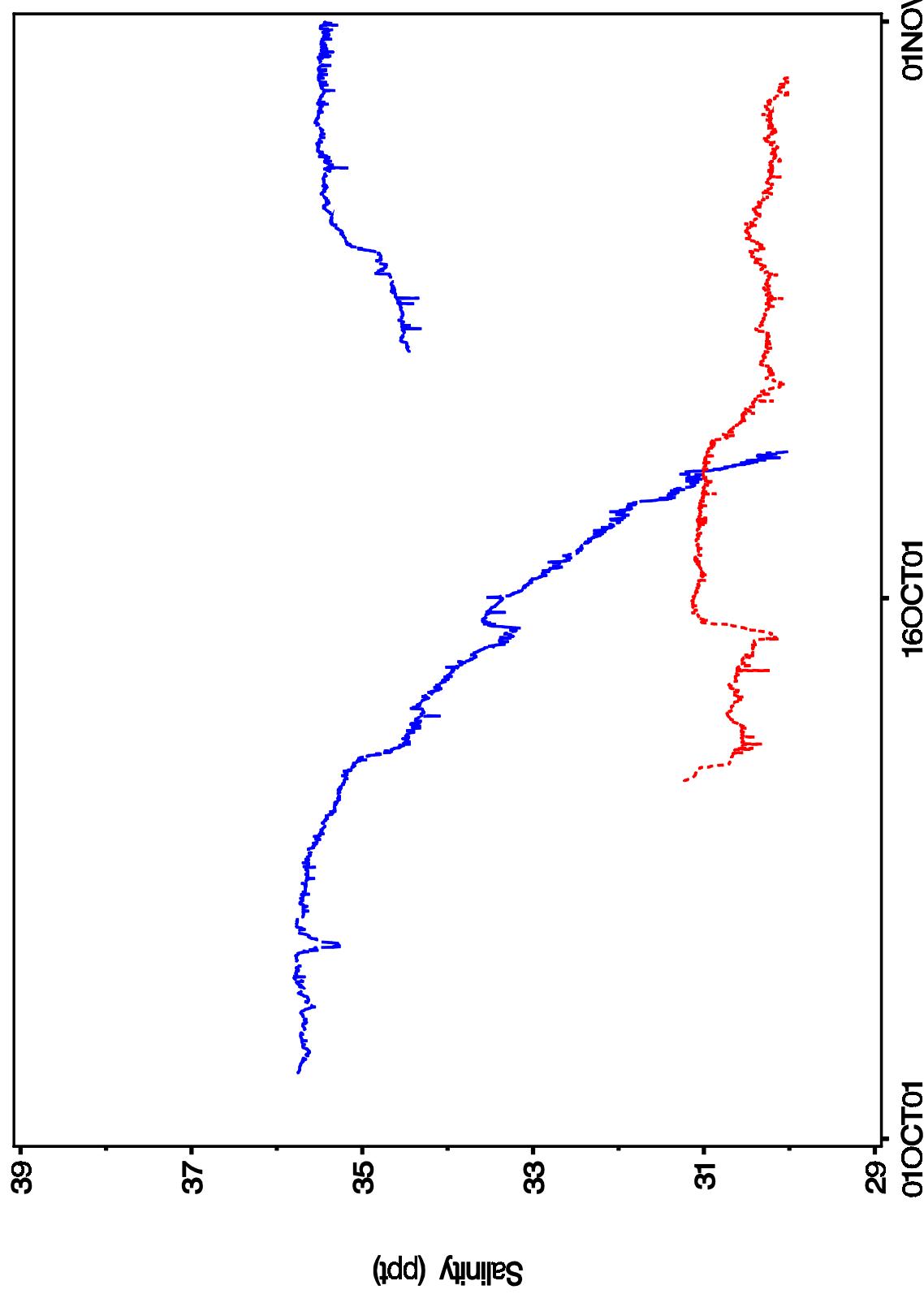


Figure SA-5. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during October 2001. Long Beach represented in blue. Ocean Crest represented in red.

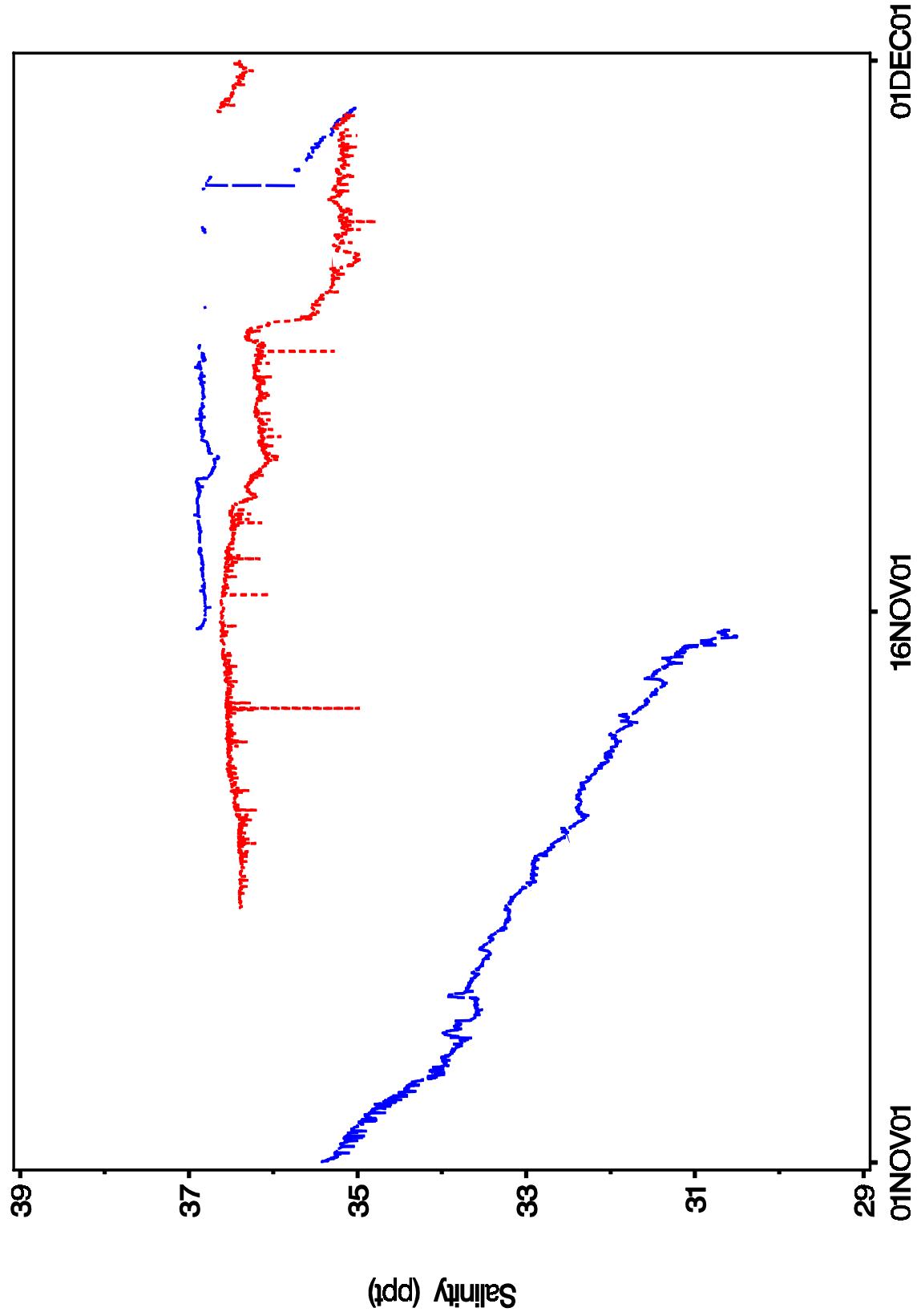


Figure SA-6. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during November 2001. Long Beach represented in blue. Ocean Crest represented in red.

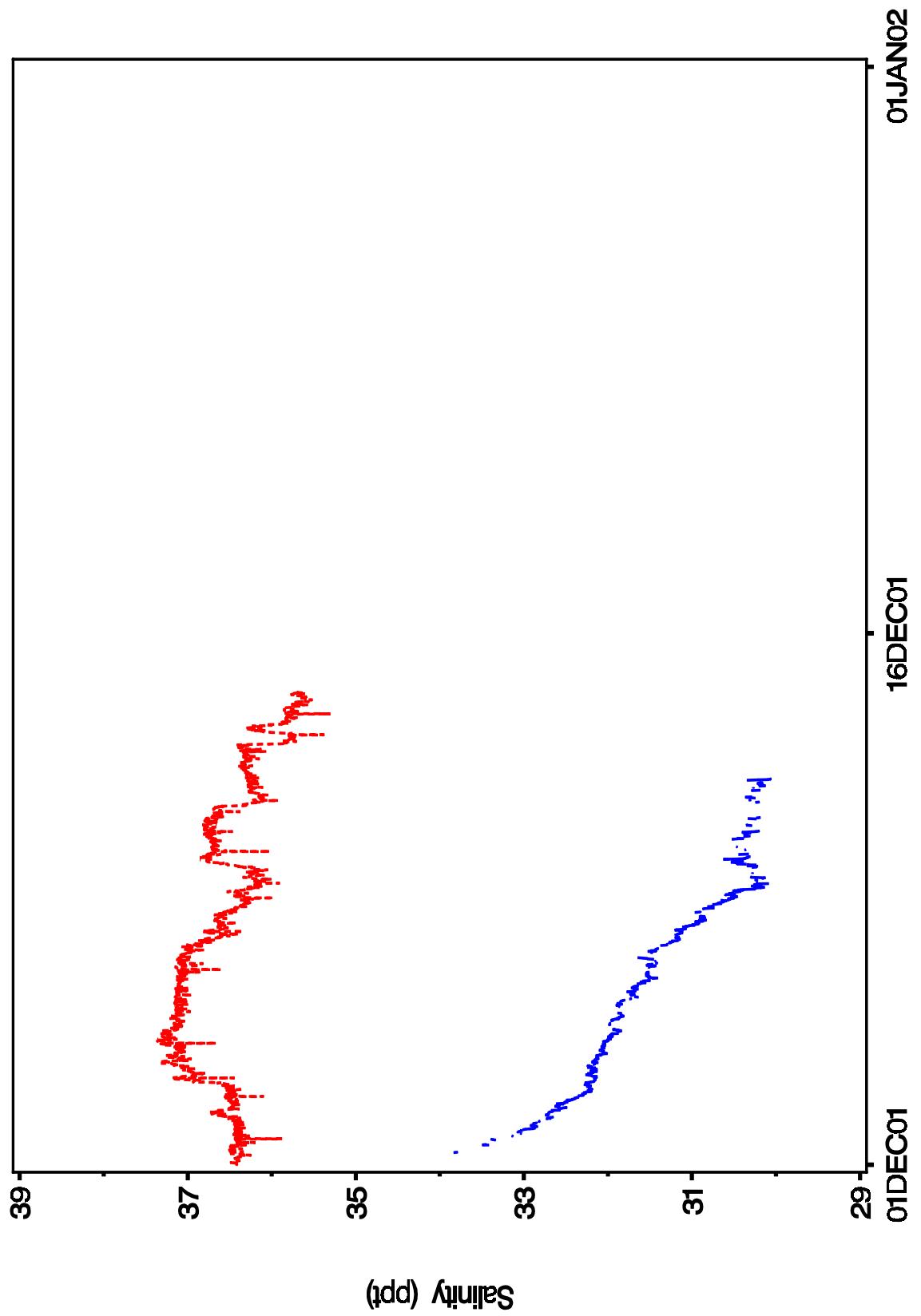


Figure SA-7. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during December 2001. Long Beach represented in blue. Ocean Crest represented in red.

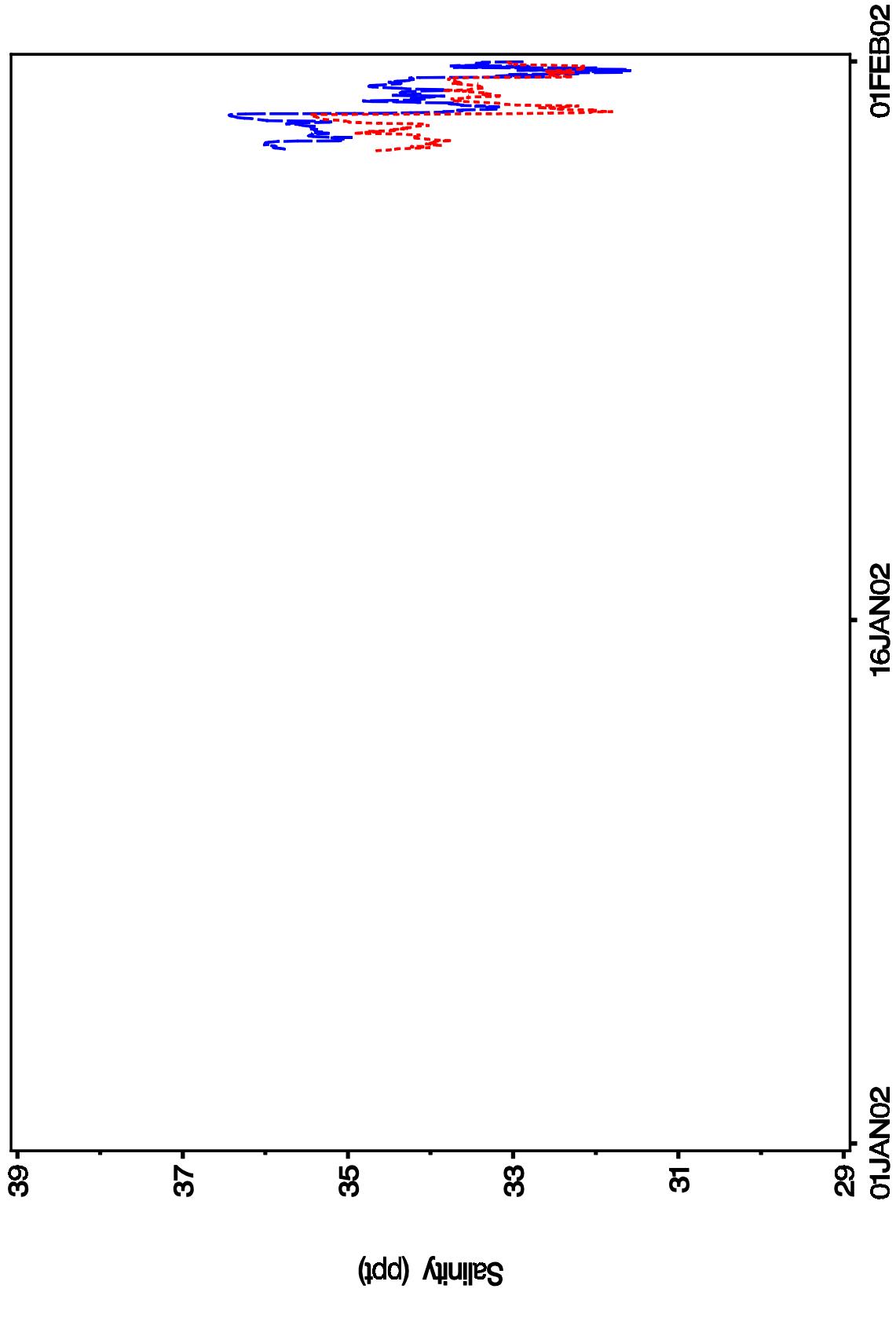


Figure SA-8. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during January 2002. Long Beach represented in blue. Ocean Crest represented in red.

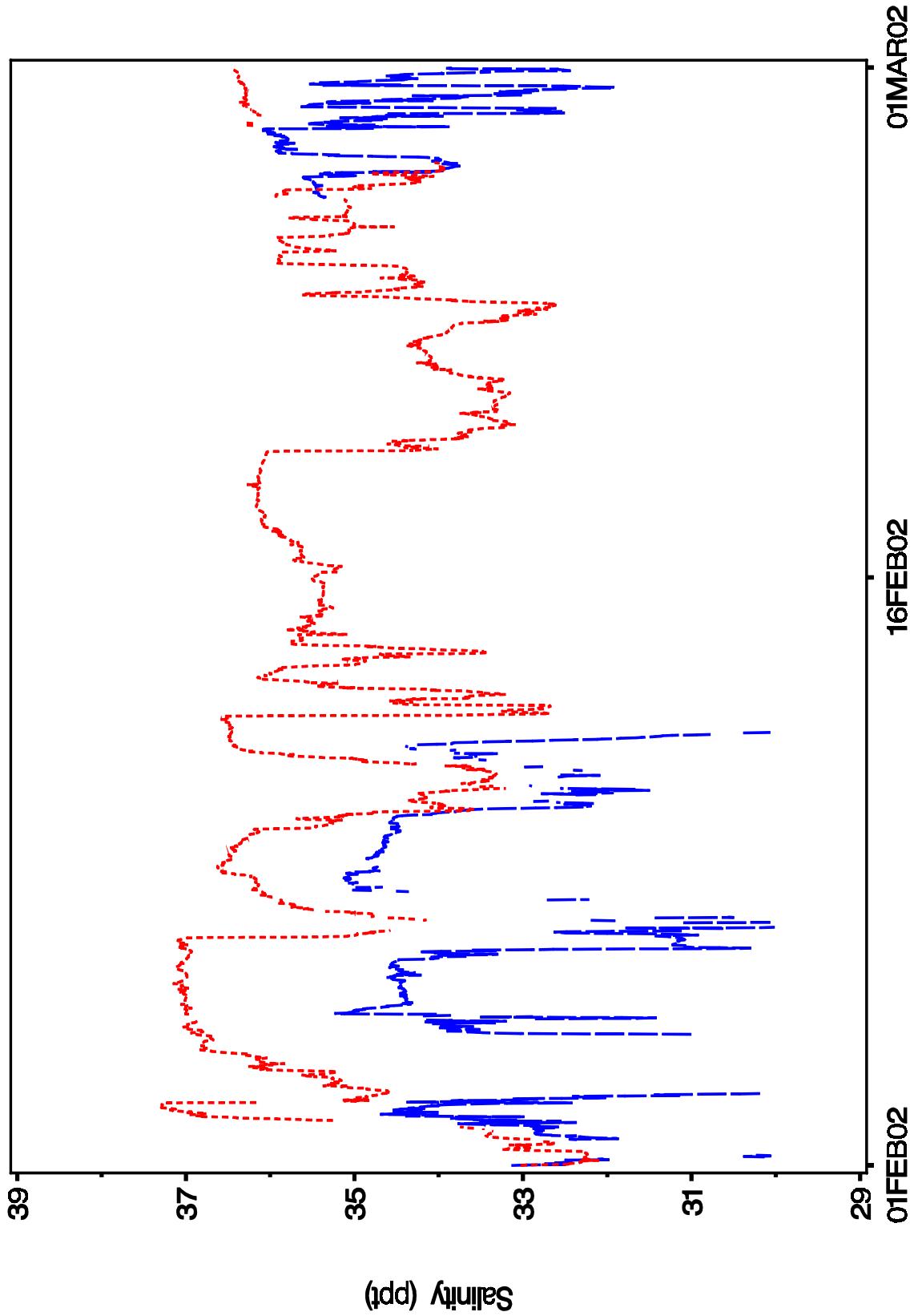


Figure SA-9. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during February 2002. Long Beach represented in blue. Ocean Crest represented in red.

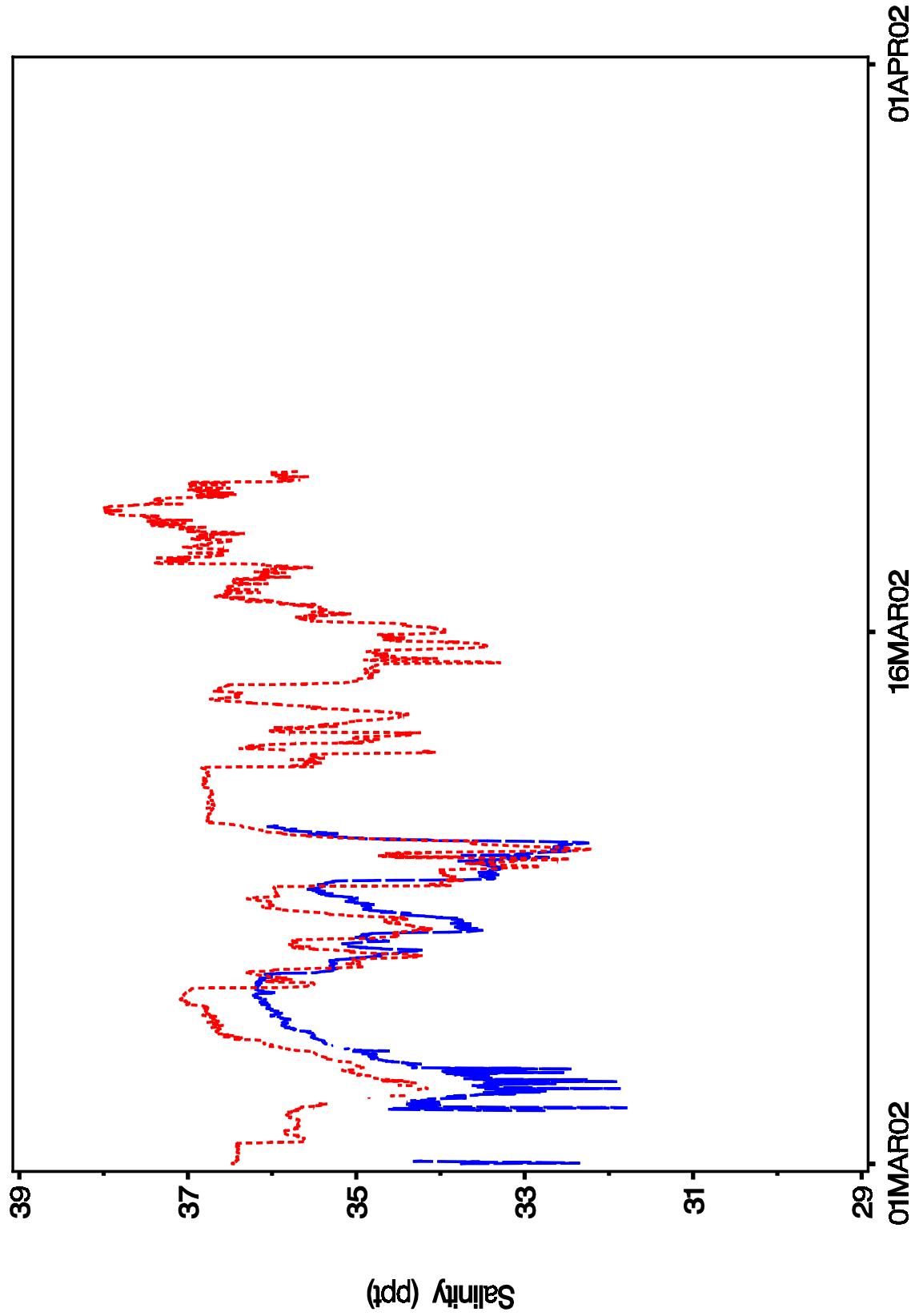


Figure SA-10. Observed salinity at Ocean Crest and Long Beach piers on Oak Island, North Carolina during March 2002. Long Beach represented in blue. Ocean Crest represented in red.

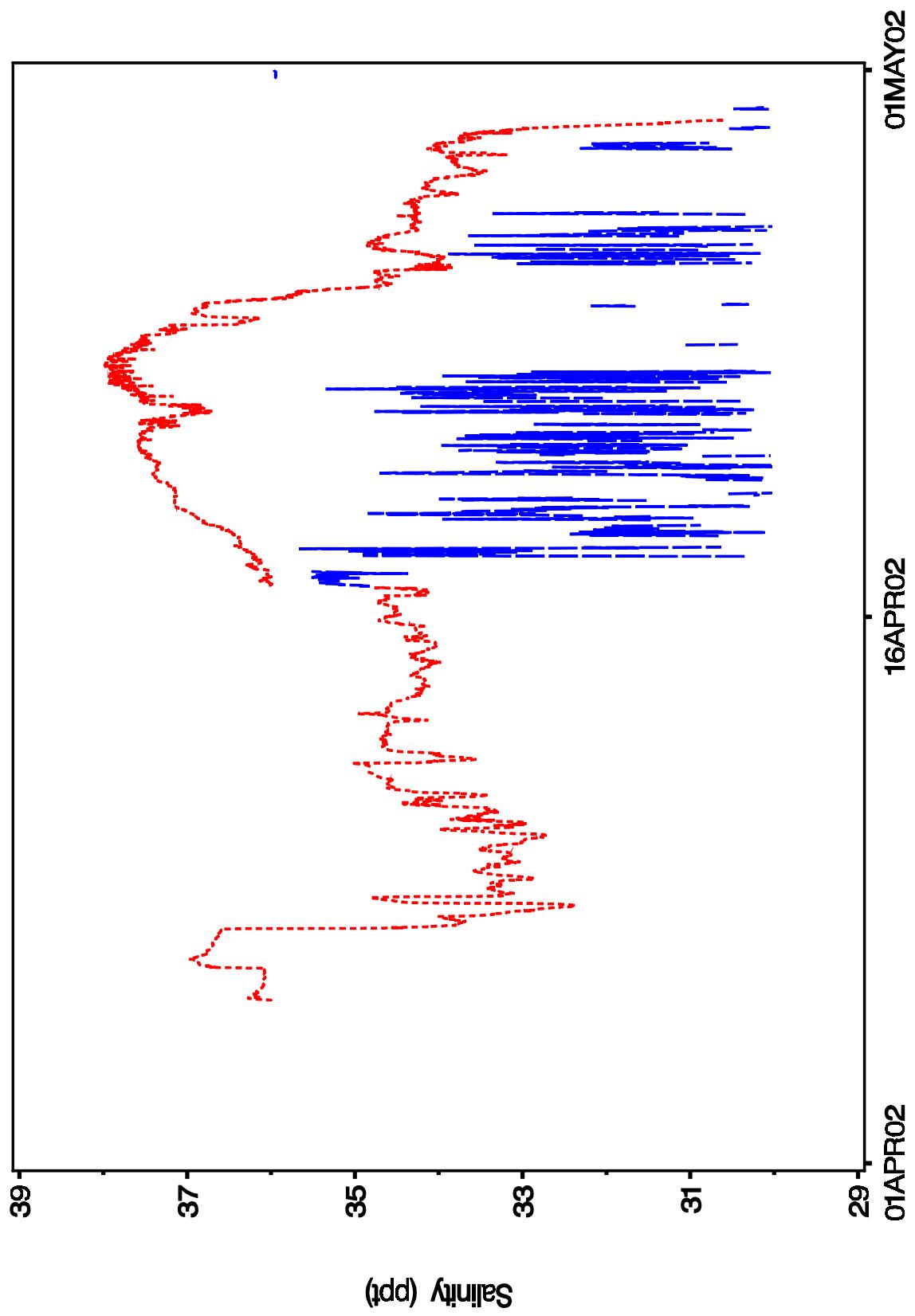


Figure SA-11. Observed salinity at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during April 2002.
Long Beach represented in blue. Ocean Crest represented in red.

DO

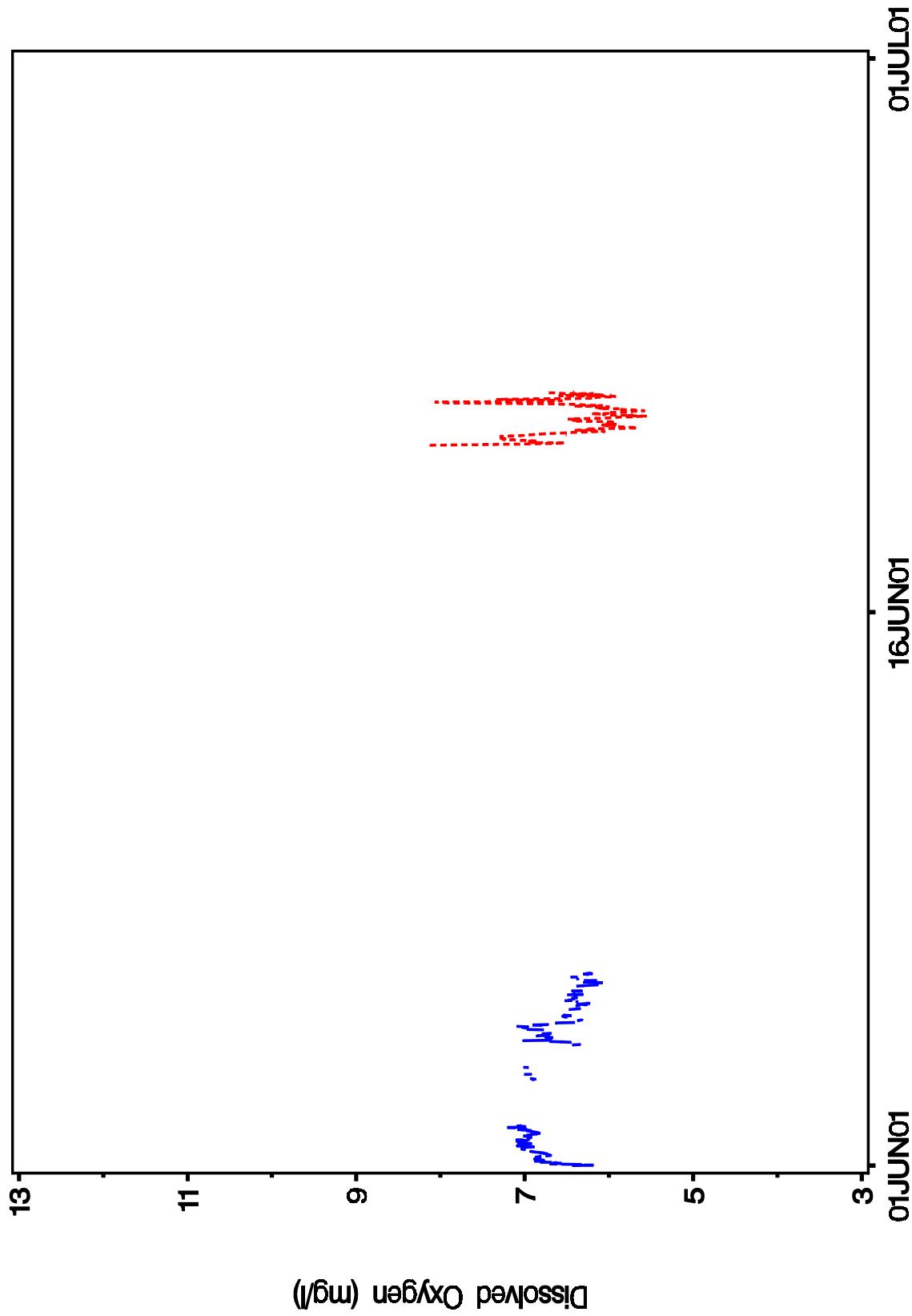


Figure DO-1. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during June 2001. Long Beach represented in blue. Ocean Crest represented in red.

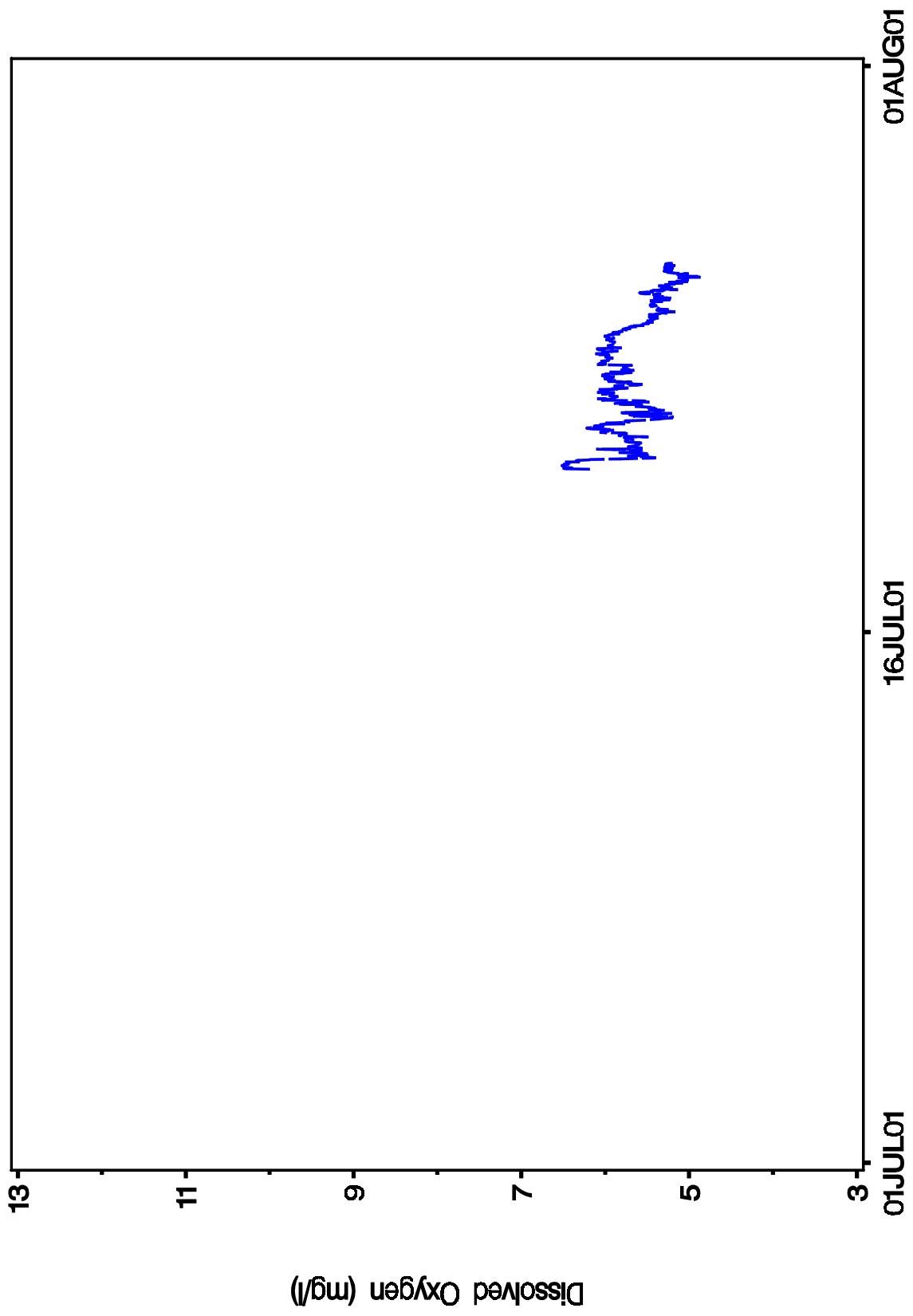


Figure DO-2. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during July 2001. Long Beach represented in red. Ocean Crest represented in blue.

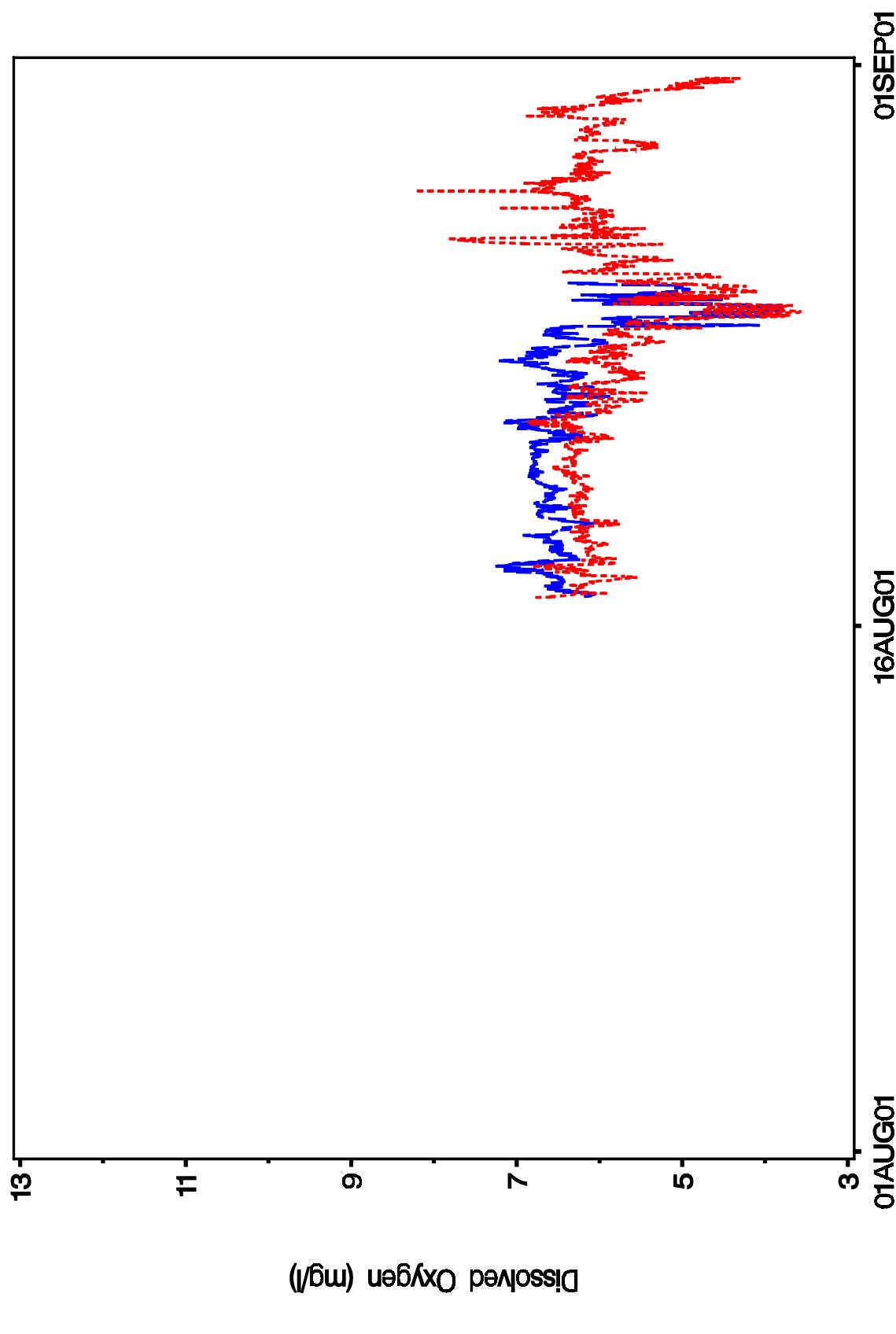


Figure DO-3. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during August 2001. Long Beach represented in blue. Ocean Crest represented in red.

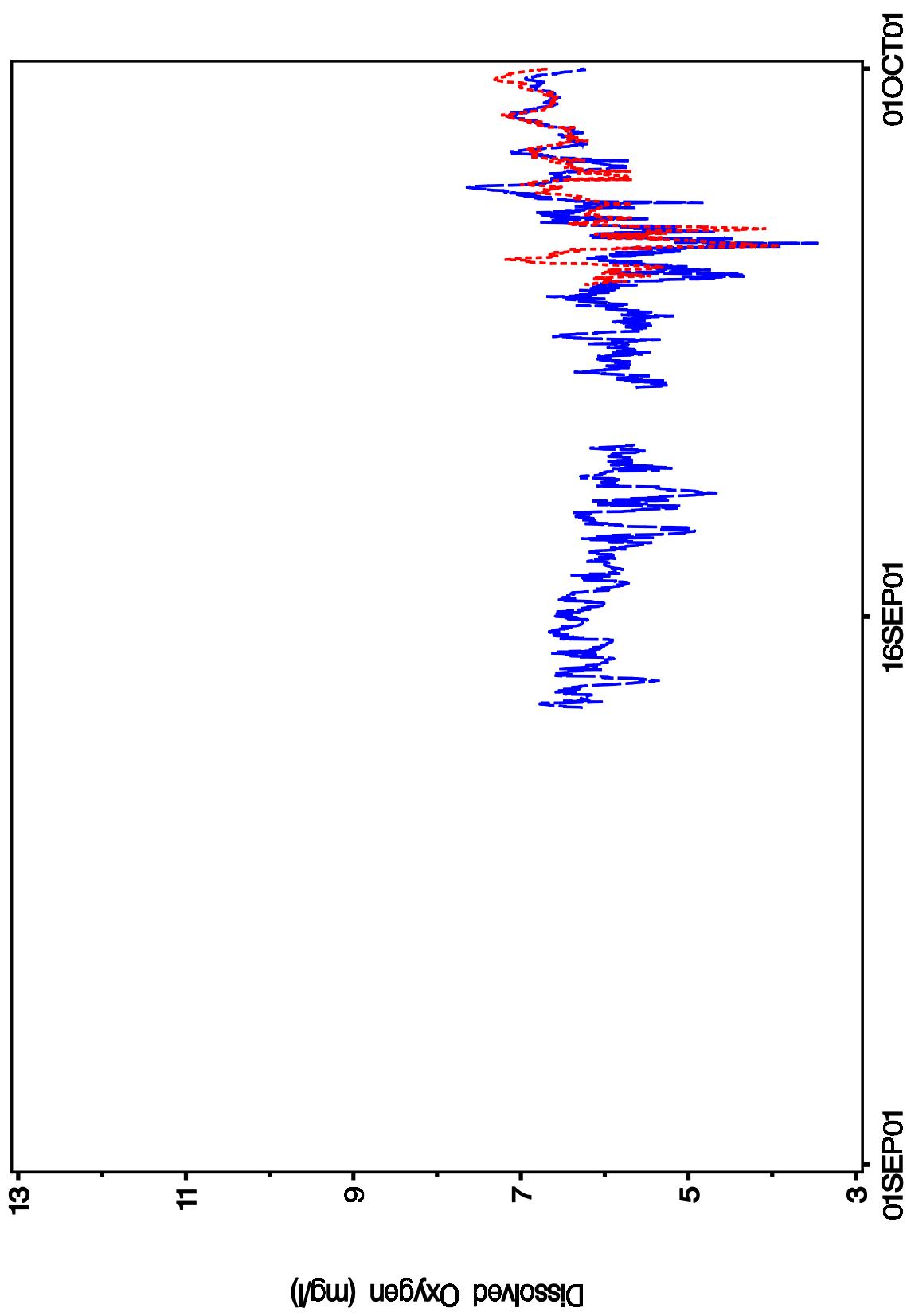


Figure DO-4. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during September 2001. Long Beach represented in blue. Ocean Crest represented in red.

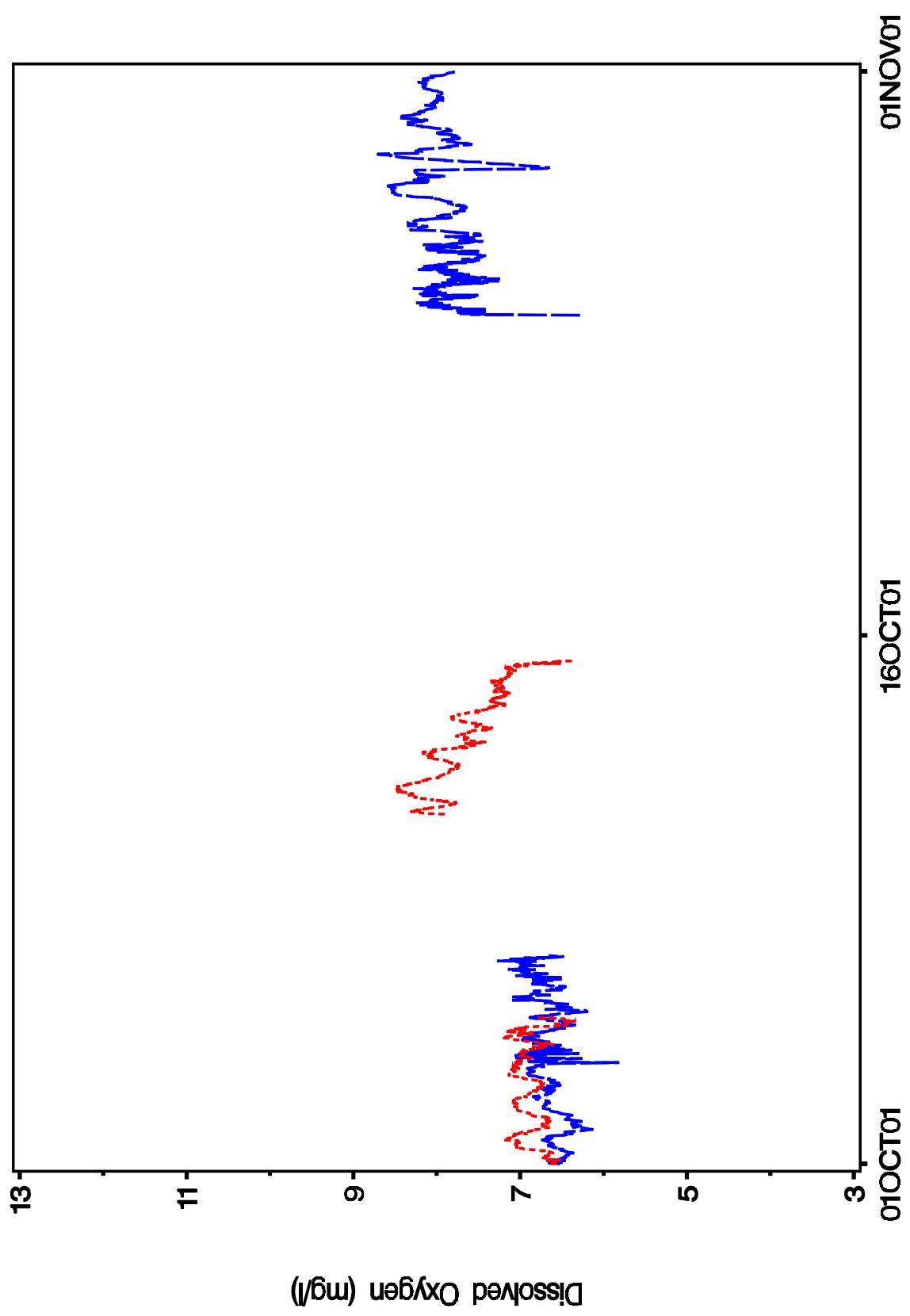


Figure DO-5. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during October 2001. Long Beach represented in red. Ocean Crest represented in blue.

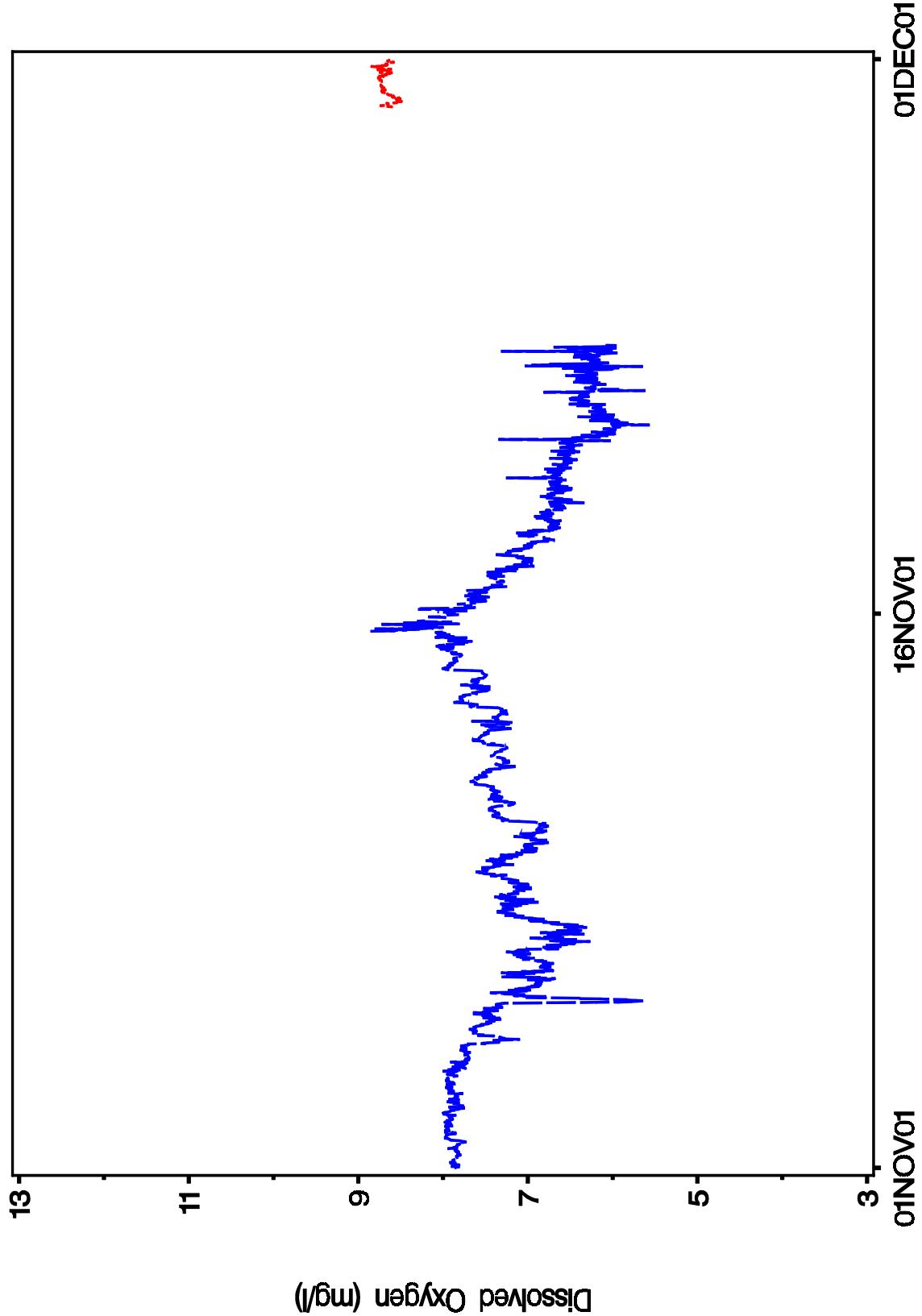


Figure D0-6. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during November 2001. Long Beach represented in blue. Ocean Crest represented in red.

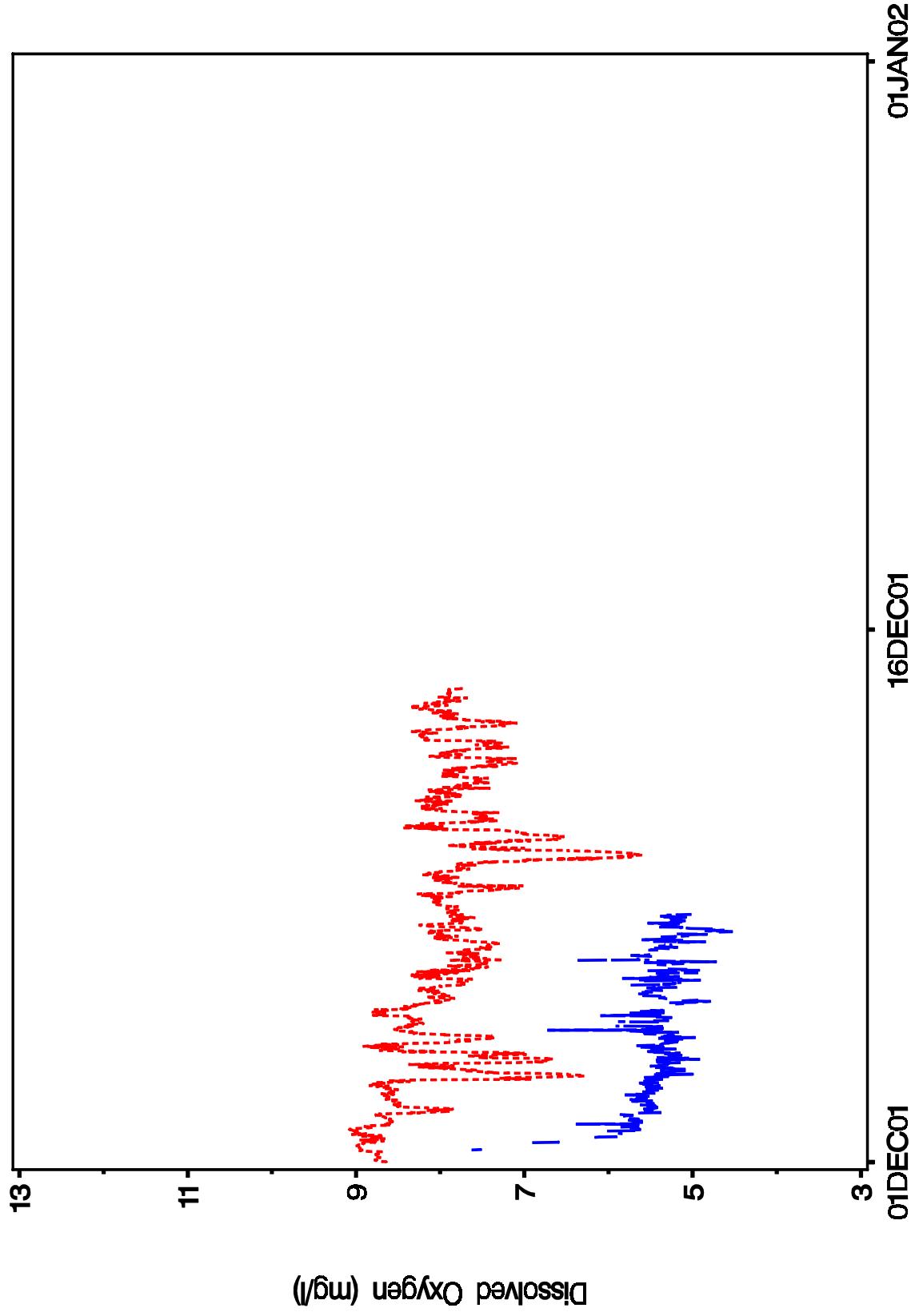


Figure D0-7. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during December 2001. Long Beach represented in blue. Ocean Crest represented in red.

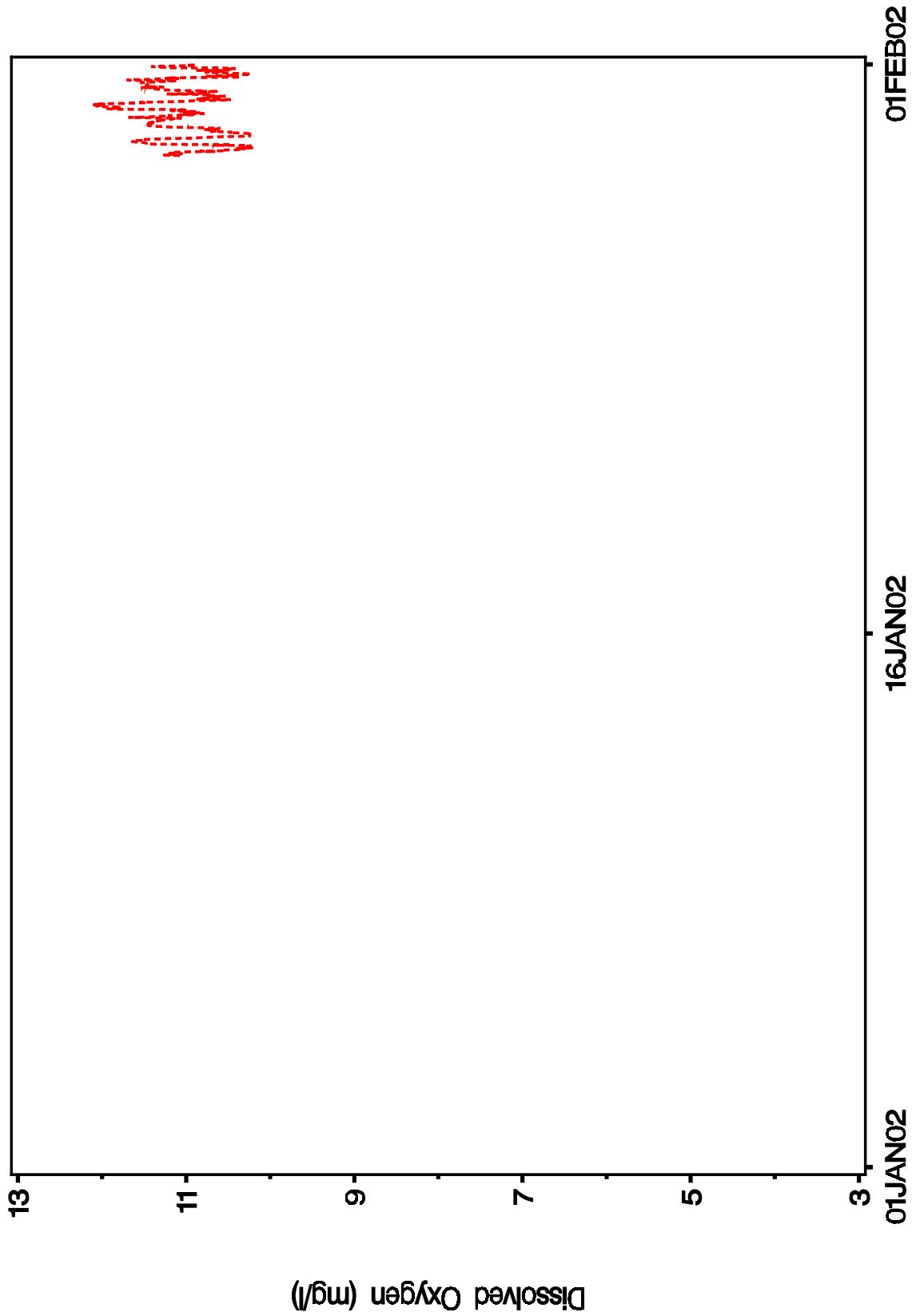


Figure DO-8. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during January 2002. Long Beach represented in blue. Ocean Crest represented in red.

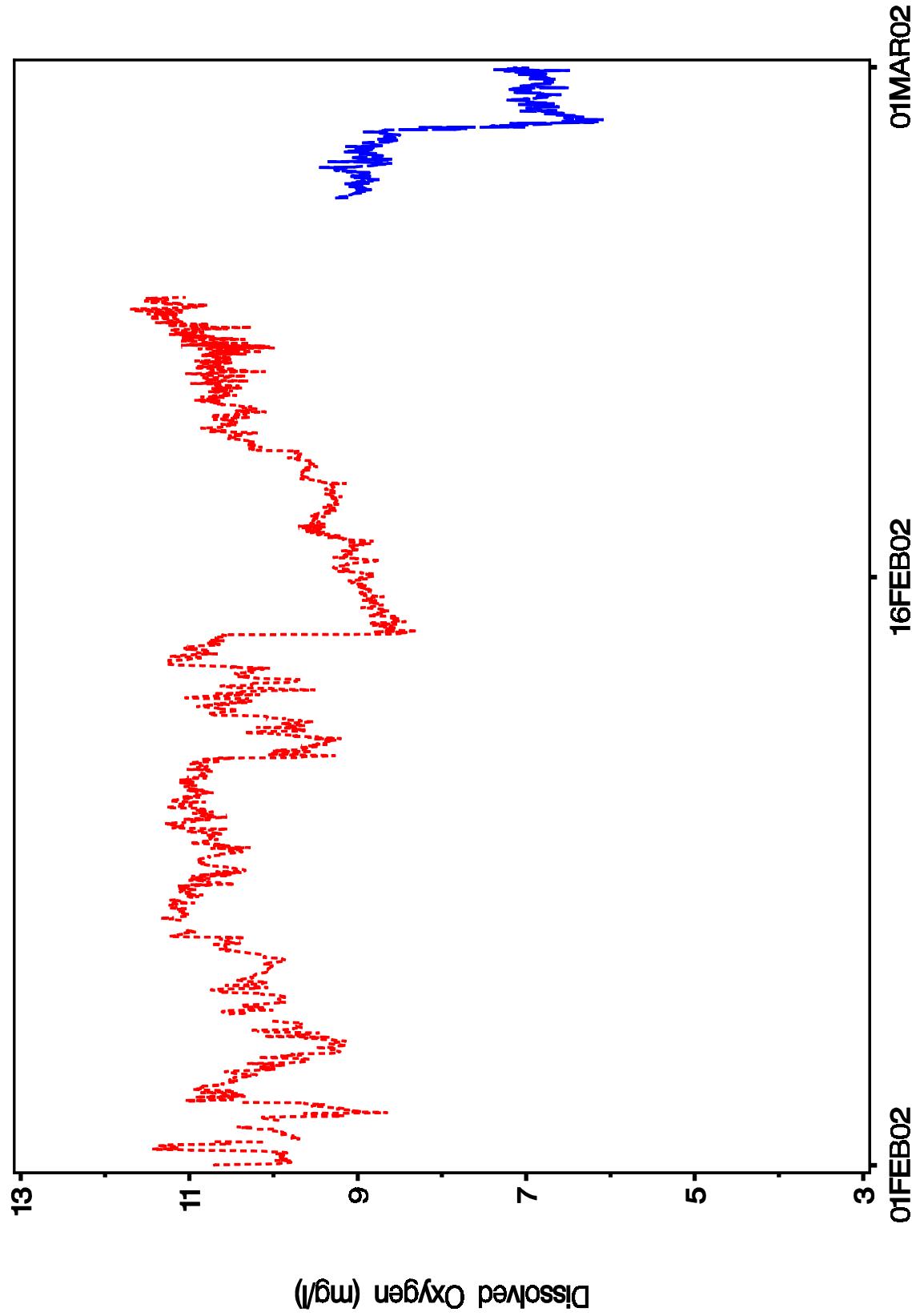


Figure DO-9. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during February 2002. Long Beach represented in blue. Ocean Crest represented in red.

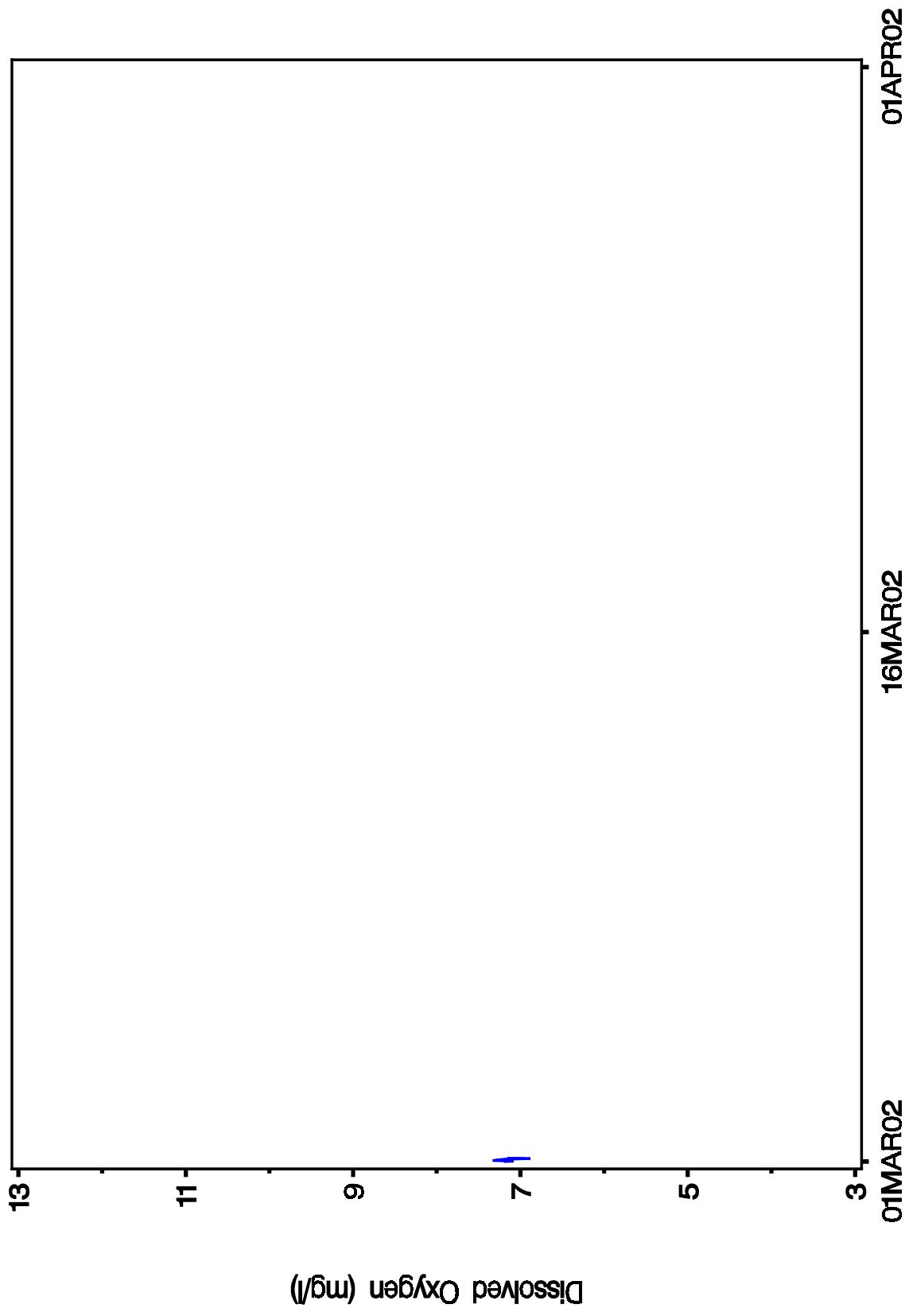


Figure DO-10. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during March 2002. Long Beach represented in blue. Ocean Crest represented in red.

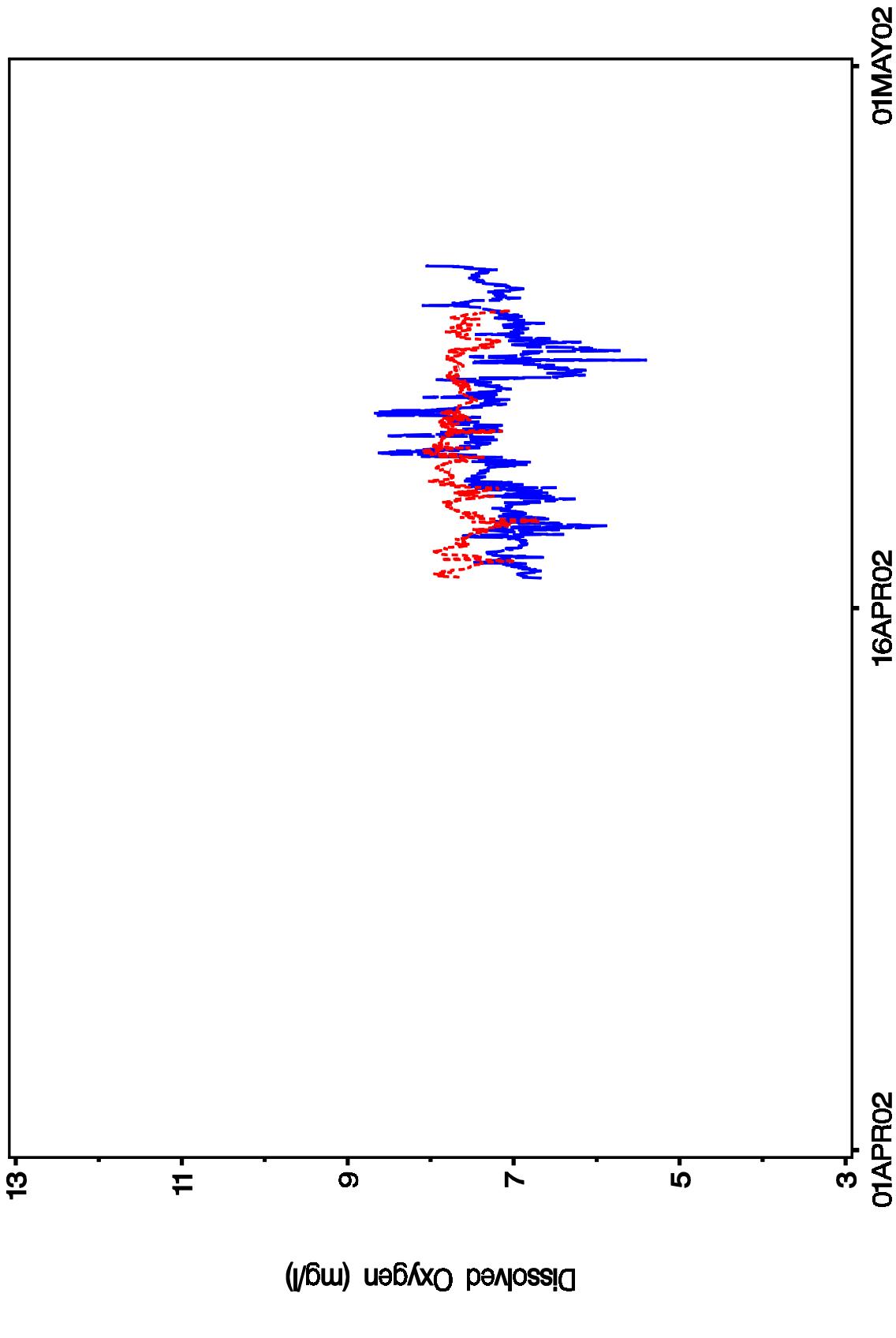


Figure DO-11. Observed dissolved oxygen at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during April 2002. Long Beach represented in blue. Ocean Crest represented in red.

PH

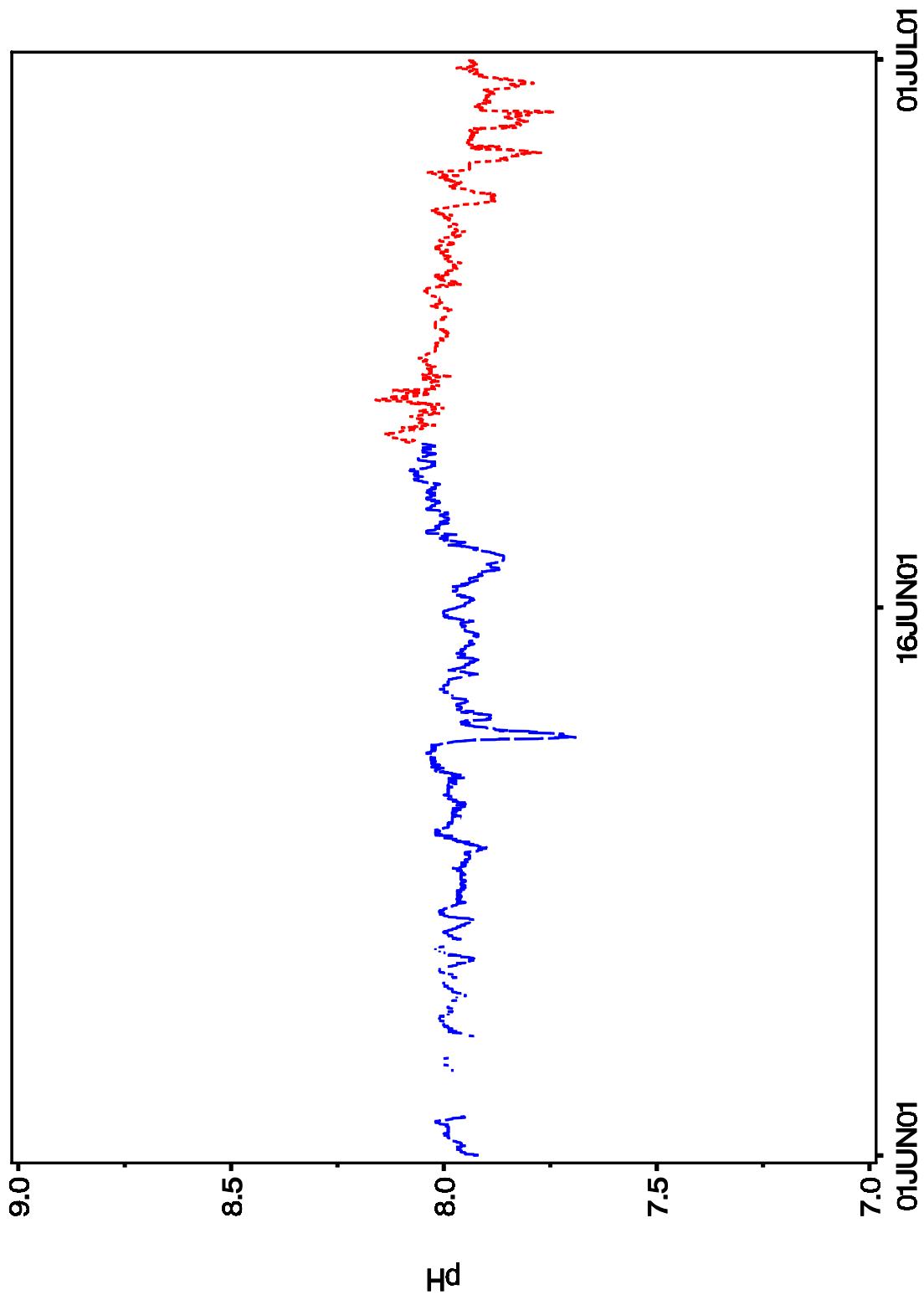


Figure pH-1. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during June 2001. Long Beach represented in blue. Ocean Crest represented in red.

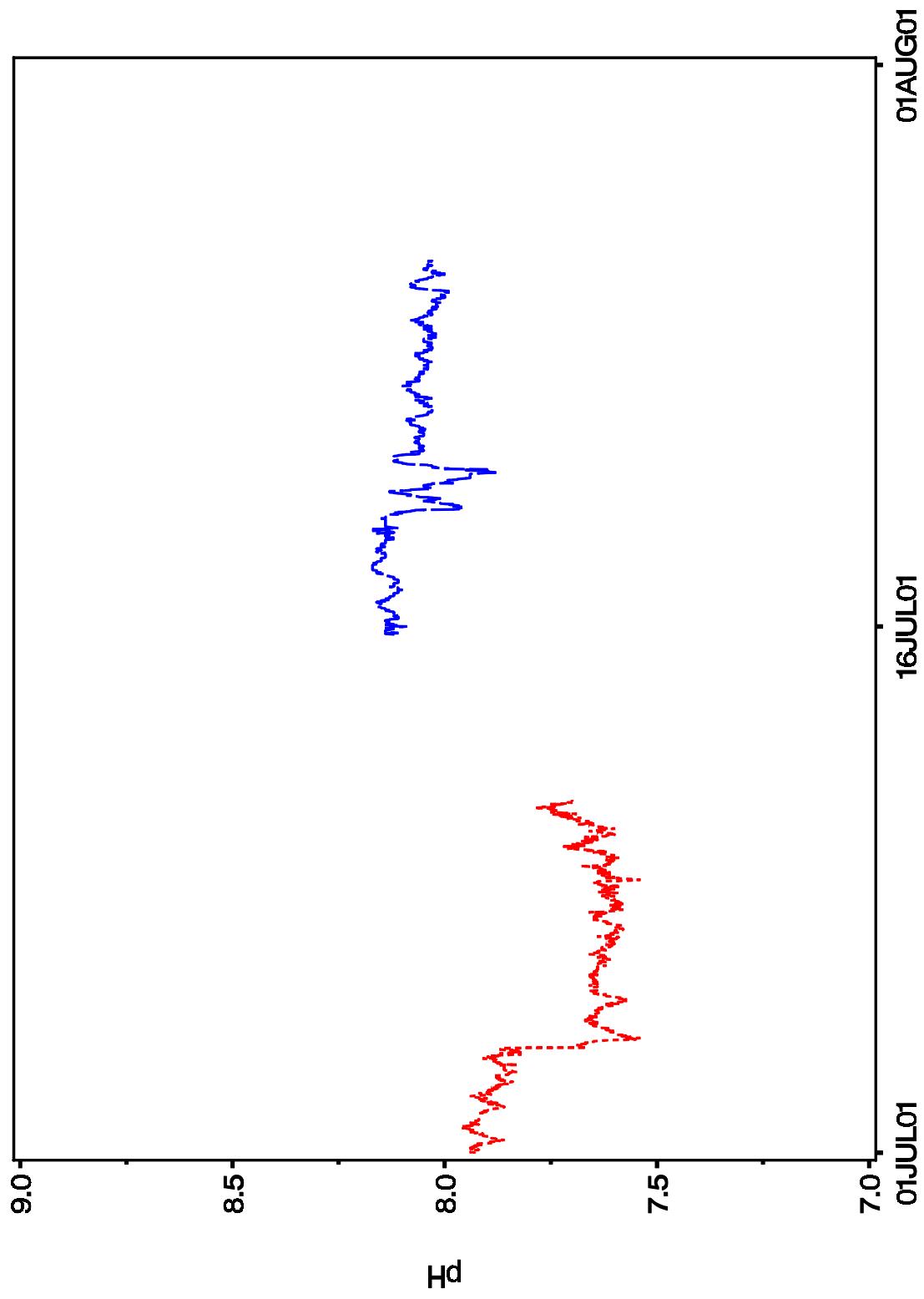


Figure pH-2. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during July 2001. Long Beach represented in red. Ocean Crest represented in blue.

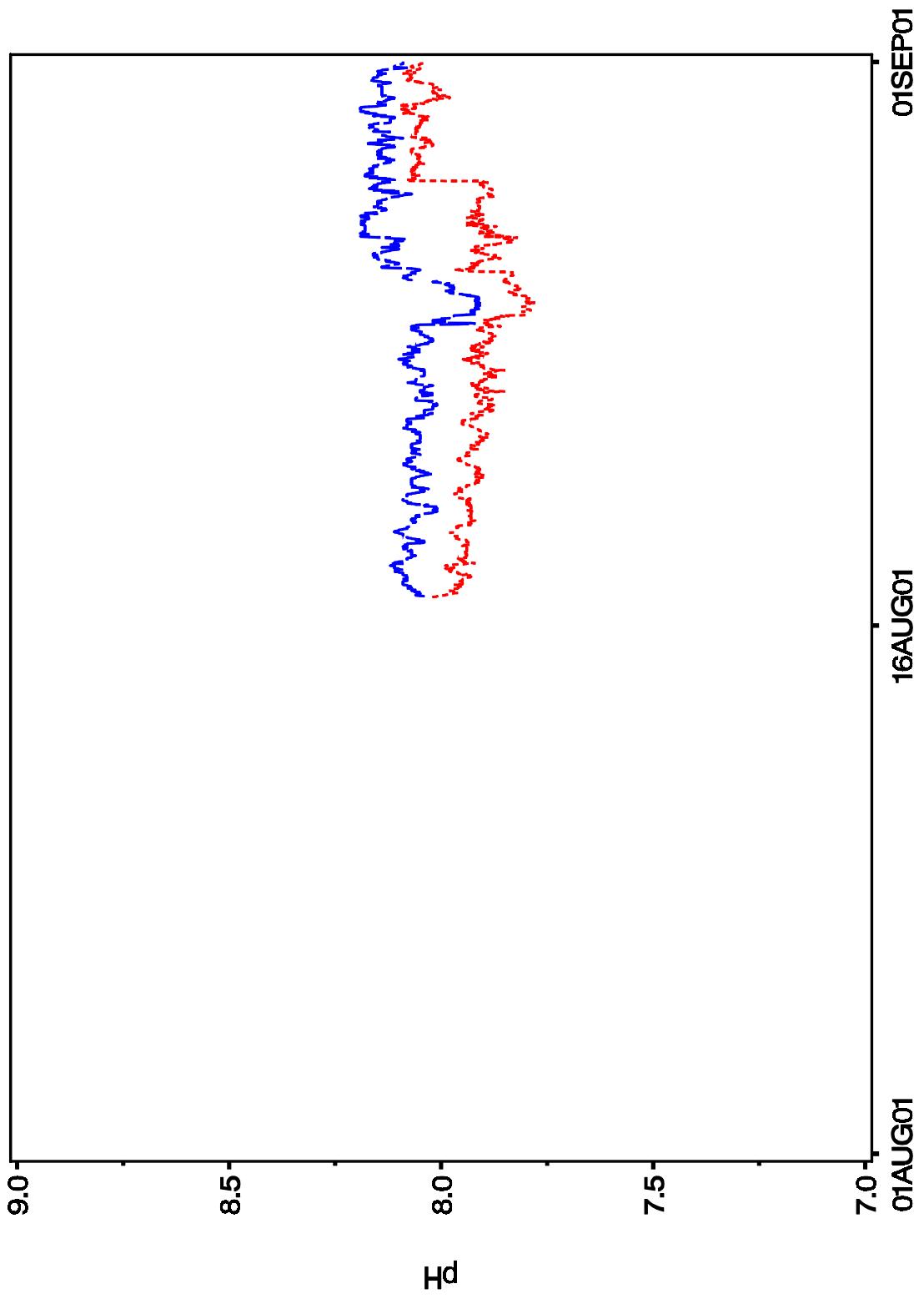


Figure pH-3. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during August 2001. Long Beach represented in blue. Ocean Crest represented in red.

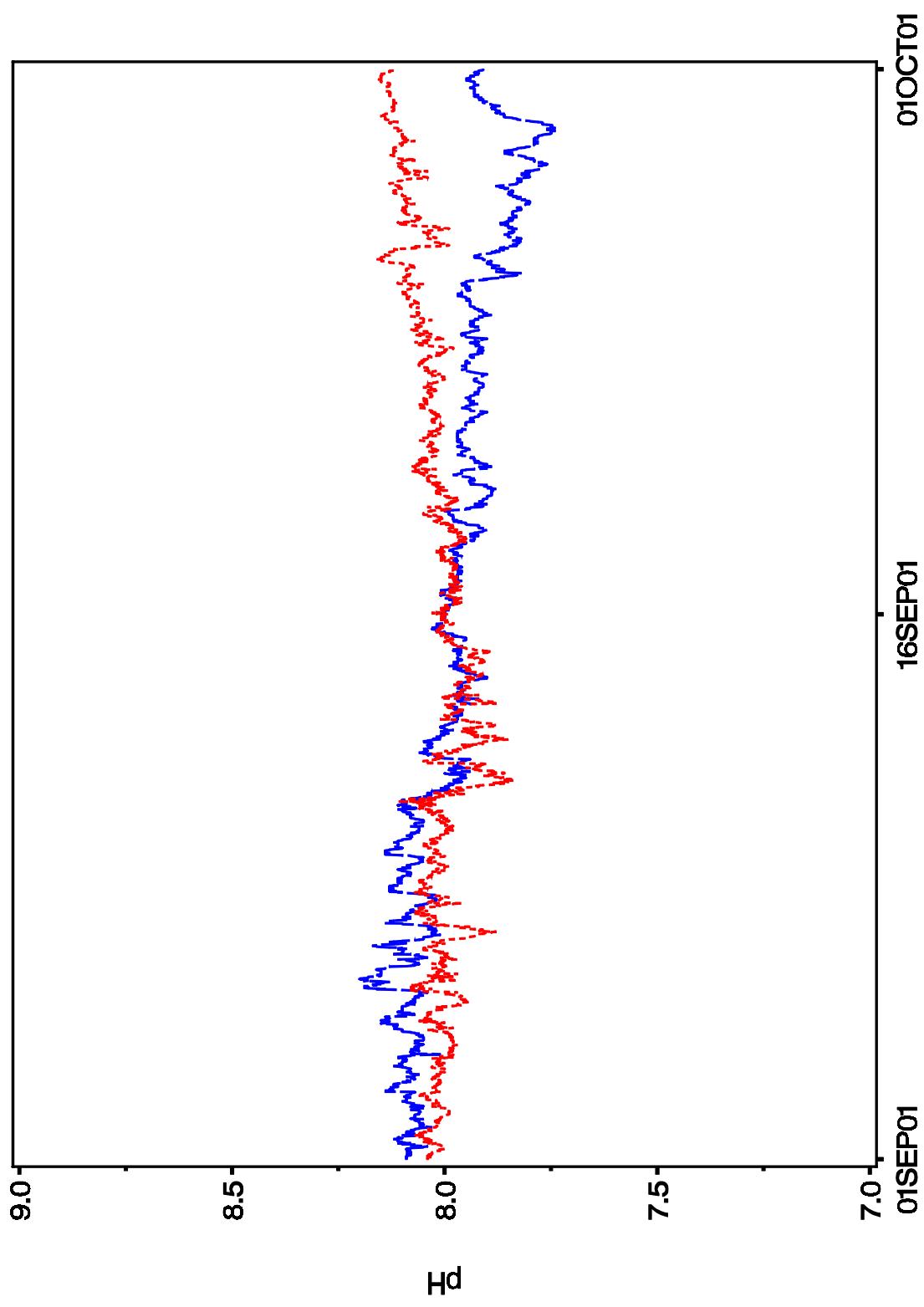


Figure pH-4. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during September 2001. Long Beach represented in blue. Ocean Crest represented in red.

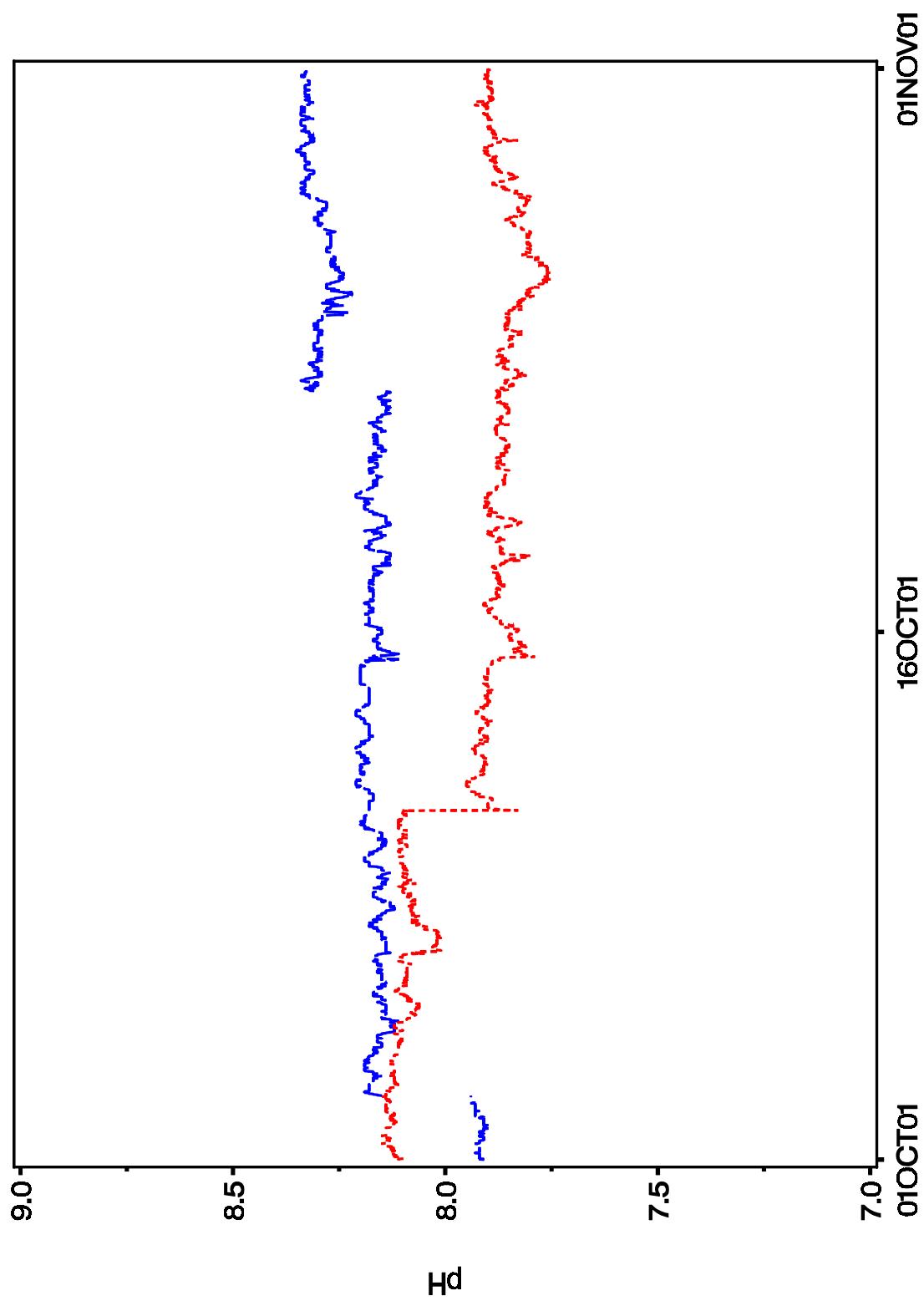


Figure pH-5. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during October 2001. Long Beach represented in blue. Ocean Crest represented in red.

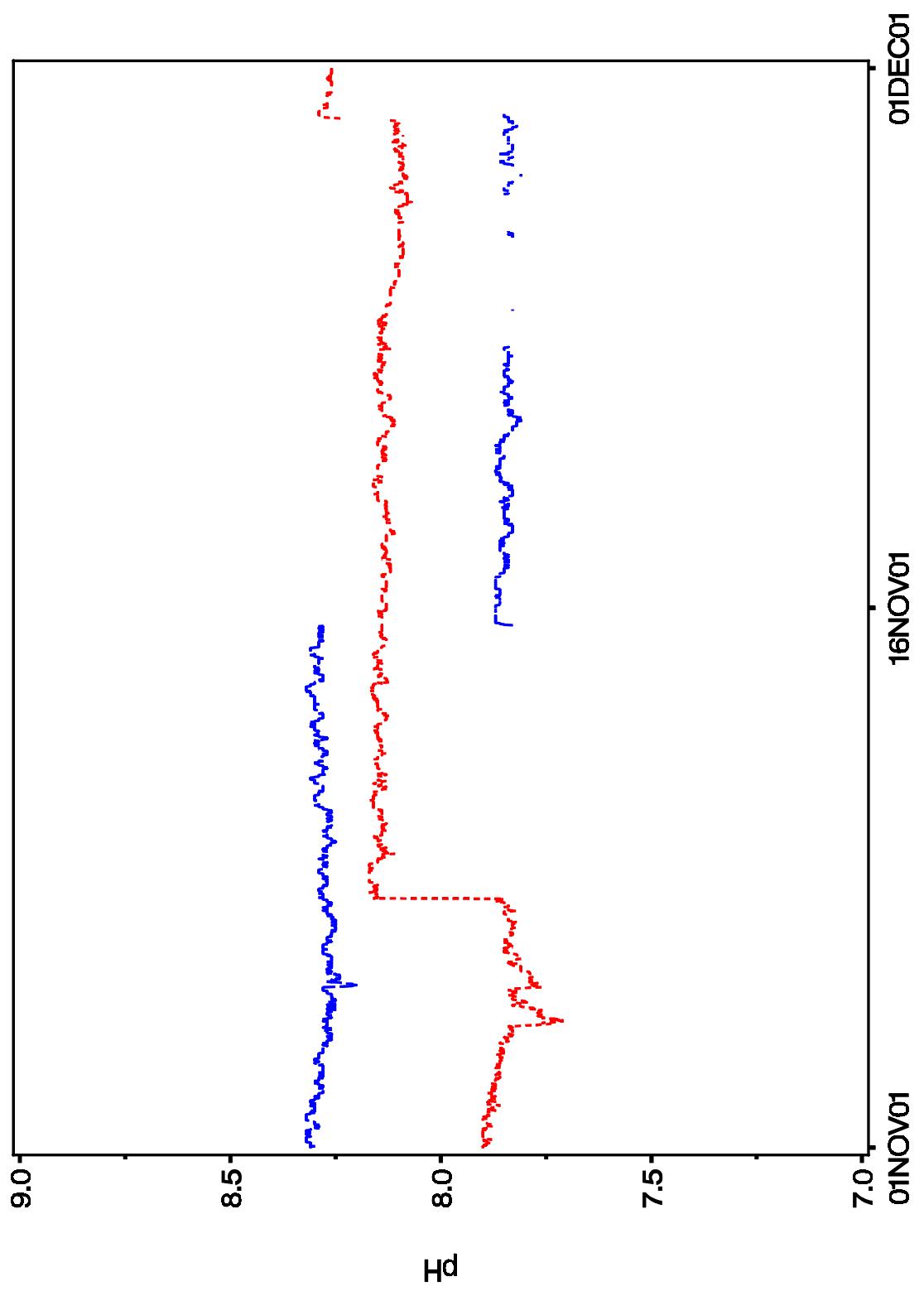


Figure pH-6. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during November 2001. Long Beach represented in blue. Ocean Crest represented in red.

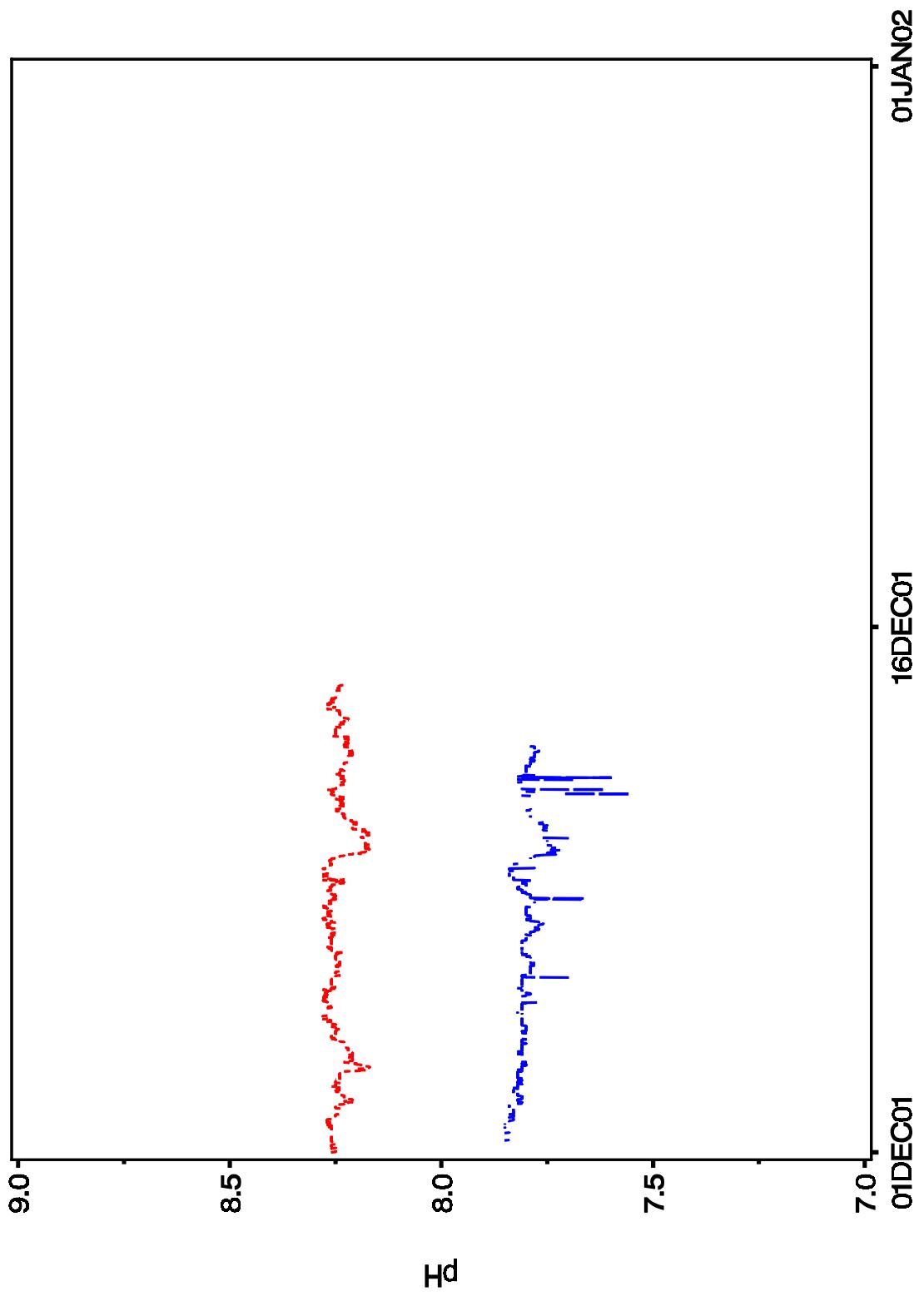


Figure pH-7. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during December 2001. Long Beach represented in blue. Ocean Crest represented in red.

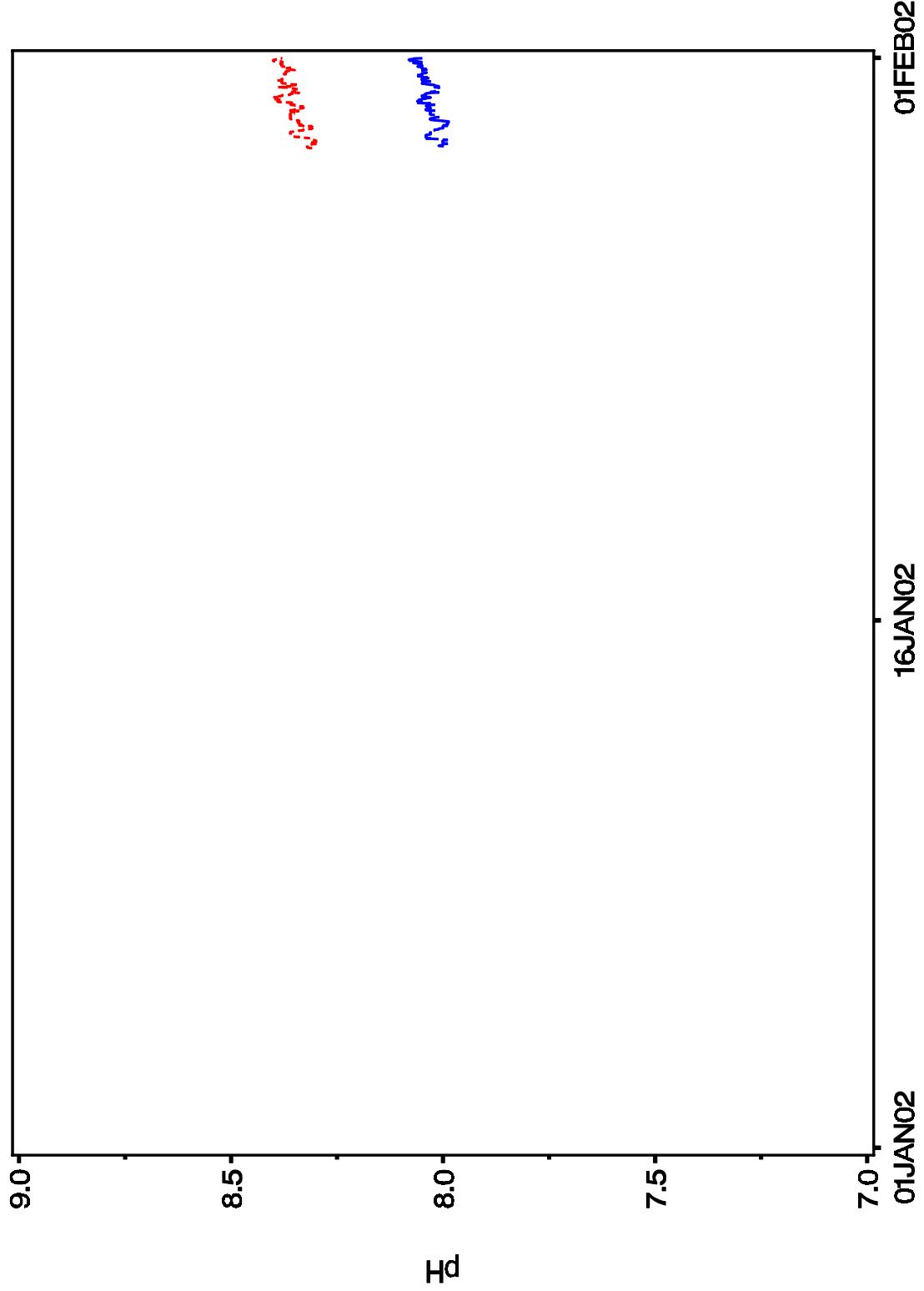


Figure pH-8. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during January 2002. Long Beach represented in blue. Ocean Crest represented in red.

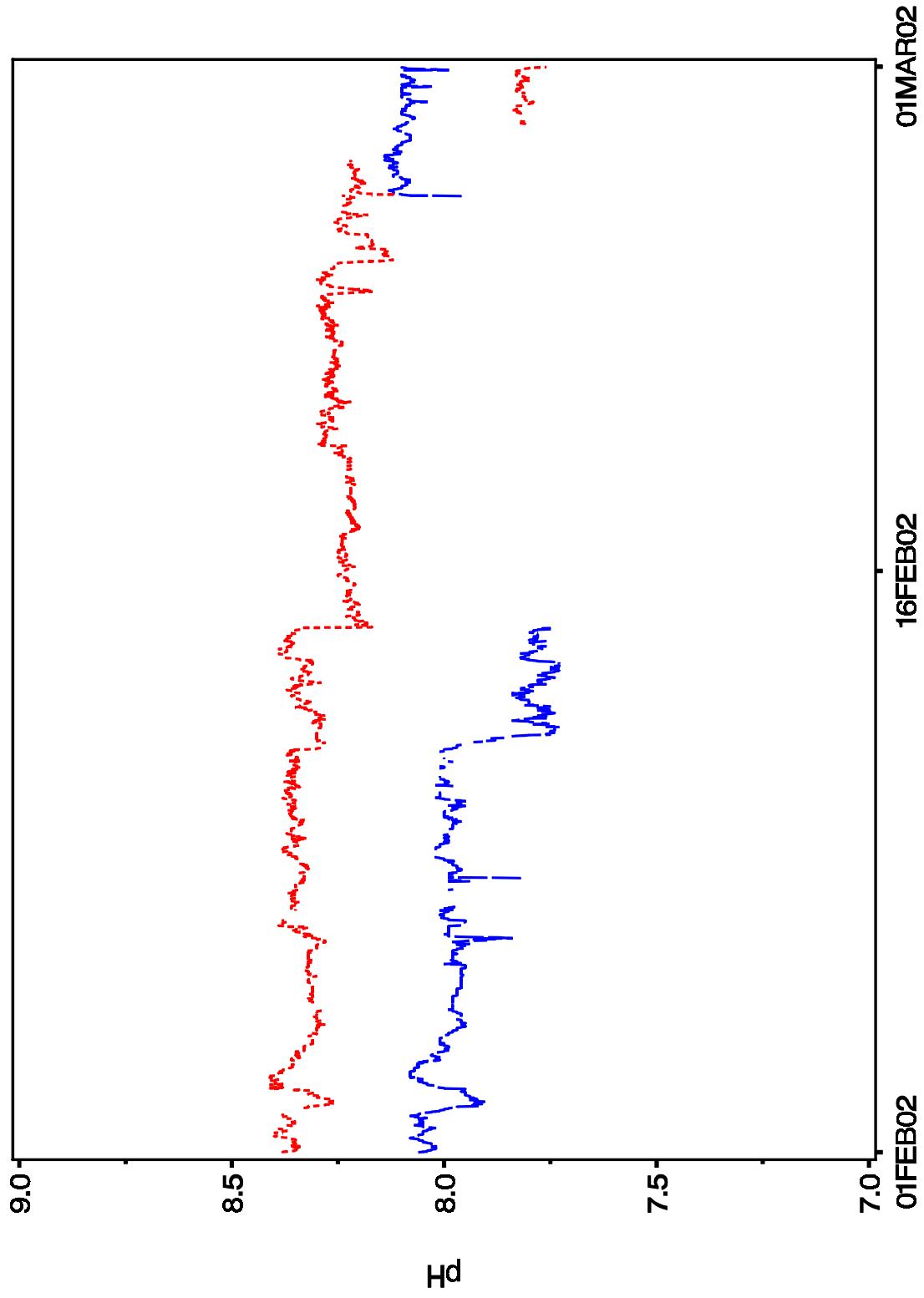


Figure pH-9. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during February 2002. Long Beach represented in blue. Ocean Crest represented in red.

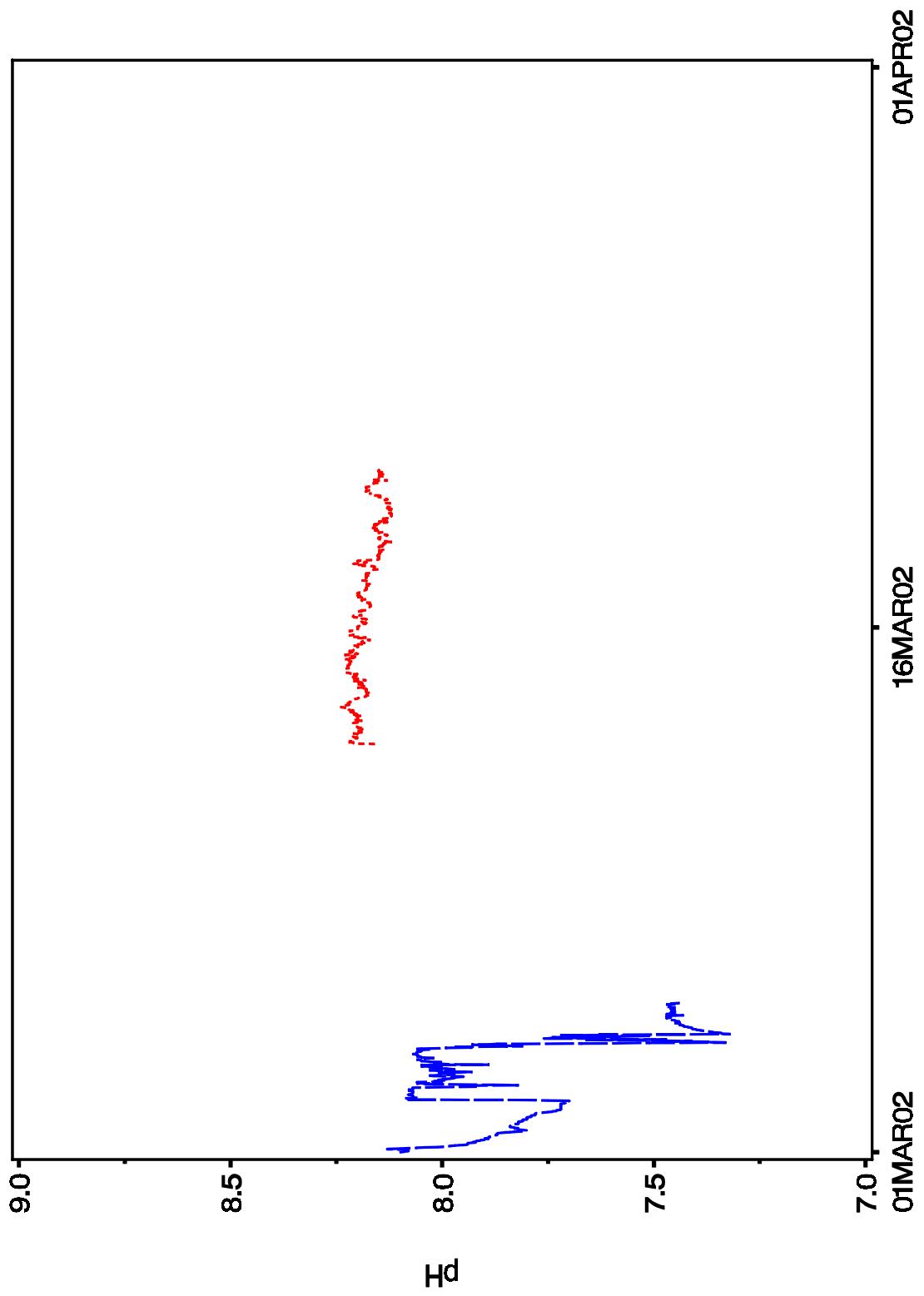


Figure pH-10. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during March 2002. Long Beach represented in blue. Ocean Crest represented in red.

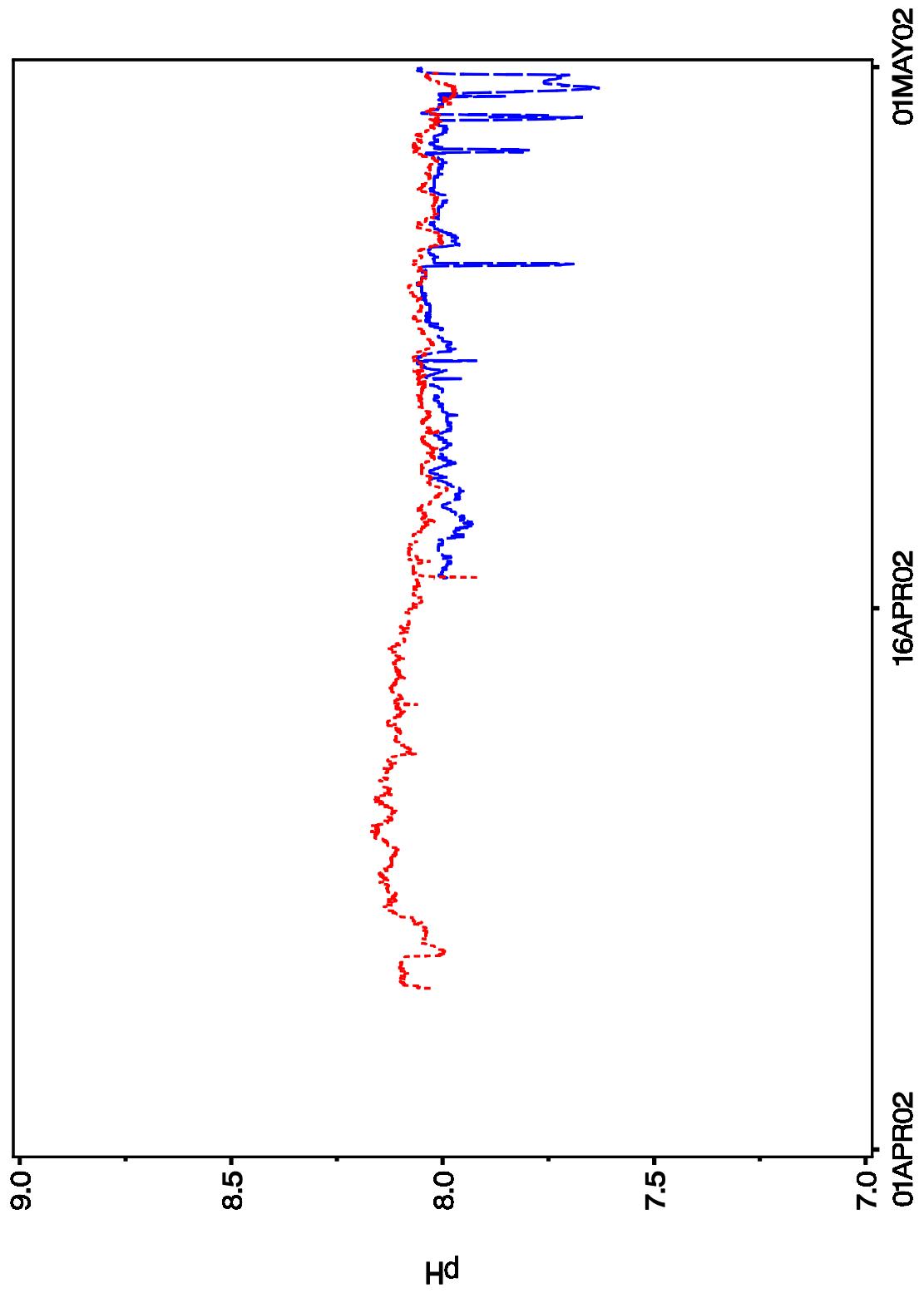


Figure pH-11. Observed pH at Ocean Crest and Long Beach Piers on Oak Island, North Carolina during April 2002. Long Beach represented in blue. Ocean Crest represented in red.

PLUME

Table PL-1 Turbidities recorded with the YSI during the plume mapping

Plume	Sample #	NTU	Dec. Lat.	Dec. Long.
1	1	58.6	33.9128	-78.1511
1	2	120.1	33.9129	-78.1527
1	3	107.7	33.913	-78.156
1	4	>1000	33.913	-78.1583
1	5	164.8	33.9131	-78.1606
1	6	67.5	33.9132	-78.1622
1	7	81.3	33.9134	-78.1642
1	8	113.9	33.9134	-78.1667
1	9	113.9	33.9133	-78.1696
1	10	20.9	33.9134	-78.1721
1	11	4.5	33.9126	-78.1716
1	12	0	33.9118	-78.1675
1	13	0	33.9119	-78.1633
1	14	0	33.9117	-78.1585
1	15	0	33.9117	-78.1539
1	16	0	33.9112	-78.1519
1	17	11.4	33.9126	-78.2018
1	18	0.5	33.9125	-78.1981
1	19	0	33.9114	-78.1505
1	20	0	33.911	-78.1663
1	21	0	33.9117	-78.1703
1	22	10.7	33.9128	-78.1735
1	23	15.9	33.9129	-78.1767
1	24	0	33.9122	-78.1795
1	25	20.9	33.913	-78.183
1	26	0	33.9116	-78.1858
1	27	22.9	33.9125	-78.1923
1	28	0	33.9117	-78.2031
1	29	7.8	33.9121	-78.2085
1	30	12.6	33.9122	-78.2114
2	1	26	33.9132	-78.1965
2	2	31.1	33.913	-78.1978
2	3	33.2	33.913	-78.1993
2	4	75.6	33.9134	-78.2009
2	5	50.2	33.9134	-78.2014
2	6	71.9	33.9134	-78.2022
2	7	103.7	33.9134	-78.2028
2	8	90.3	33.9133	-78.2035

Table PL-1 (Continued)

Plume	Sample #	NTU	Dec. Lat.	Dec. Long.
2	9	83.3	33.913	-78.2041
2	10	51.5	33.9128	-78.205
2	11	57.4	33.9131	-78.2056
2	12	87	33.9132	-78.2073
2	13	77.5	33.9131	-78.2086
2	14	113.5	33.913	-78.21
2	15	84.7	33.9129	-78.2117
2	16	51.9	33.9123	-78.2099
2	17	35.1	33.9122	-78.2075
2	18	46.2	33.9123	-78.2058
2	19	33.1	33.9124	-78.2044
2	20	24	33.9124	-78.2029
3	1	32.3	33.9138	-78.1952
3	2	43	33.9132	-78.1952
3	3	295.4	33.9132	-78.1954
3	4	137.8	33.9136	-78.2023
3	5	109.7	33.9135	-78.2024
3	6	65.2	33.9135	-78.2034
3	7	76.9	33.9134	-78.2033
3	8	93.1	33.9133	-78.2047
3	9	433.1	33.9132	-78.2047
3	10	91.3	33.9133	-78.2061
3	11	926.1	33.9131	-78.2061
3	12	>1000	33.9134	-78.2046
3	13	>1000	33.9131	-78.2045
3	14	>1000	33.9134	-78.2026
3	15	>1000	33.9132	-78.2026
3	16	673	33.9132	-78.2018
3	17	54.2	33.913	-78.2017
3	18	37.4	33.9131	-78.2089
3	19	47	33.913	-78.211
3	20	86.8	33.9127	-78.2109
4	1	94.6	33.9122	-78.2188
4	2	93.2	33.9122	-78.2189
4	3	480.3	33.9122	-78.2193
4	4	>1000	33.9122	-78.2196
4	5	>1000	33.9122	-78.2198
4	6	586.3	33.9122	-78.2207

Table PL-1 (Continued)

Plume	Sample #	NTU	Dec. Lat.	Dec. Long.
4	7	254.7	33.9122	-78.2205
4	8	>1000	33.9124	-78.221
4	9	234.1	33.9122	-78.2211
4	10	>1000	33.9122	-78.2217
4	11	>1000	33.912	-78.2218
4	12	56.8	33.912	-78.2221
4	13	89.9	33.9118	-78.2222
4	14	46.9	33.912	-78.2225
4	15	52.8	33.9118	-78.2226
4	16	48.1	33.9122	-78.2233
4	17	51.2	33.912	-78.2233
4	18	46.3	33.9121	-78.2238
4	19	46.8	33.9119	-78.2239
4	20	35	33.9119	-78.225

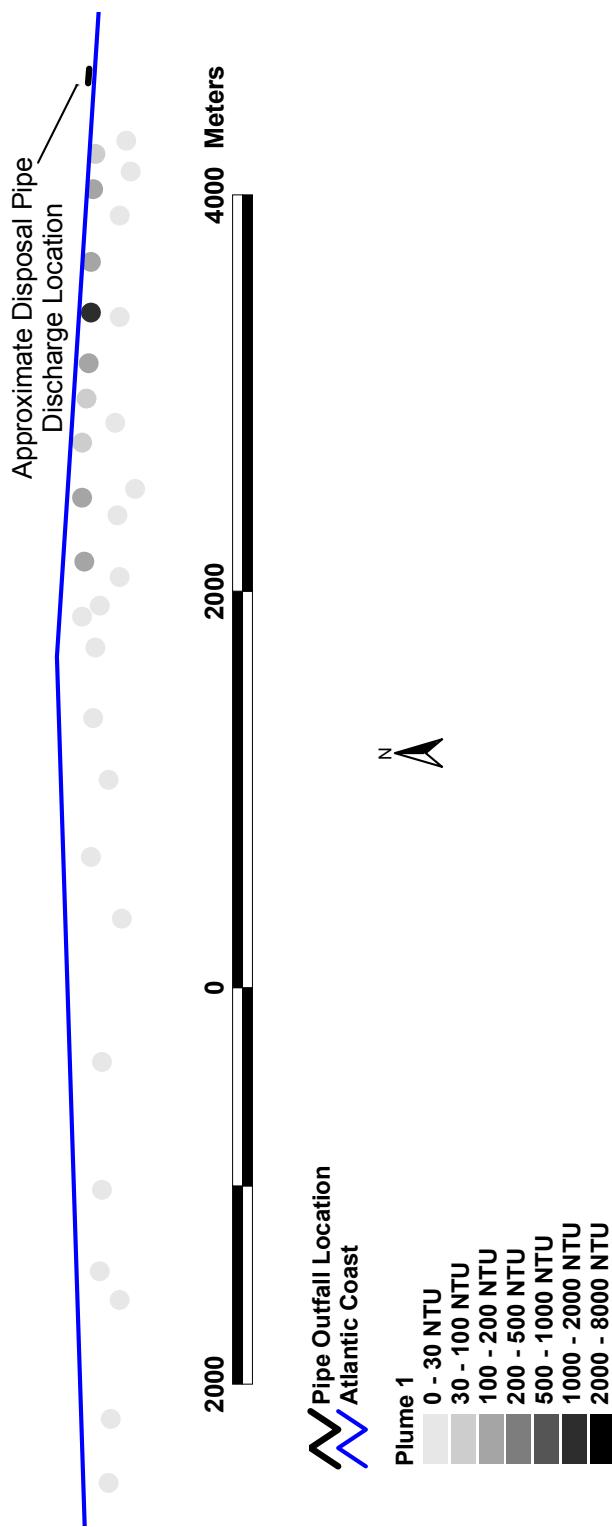


Figure PL-1. Results of turbidity plume mapping on Oak Island conducted on November 1, 2001. Mapping was conducted between 11:30 and 13:00 hours during an ebb tide when the wind direction was from the South-South-East

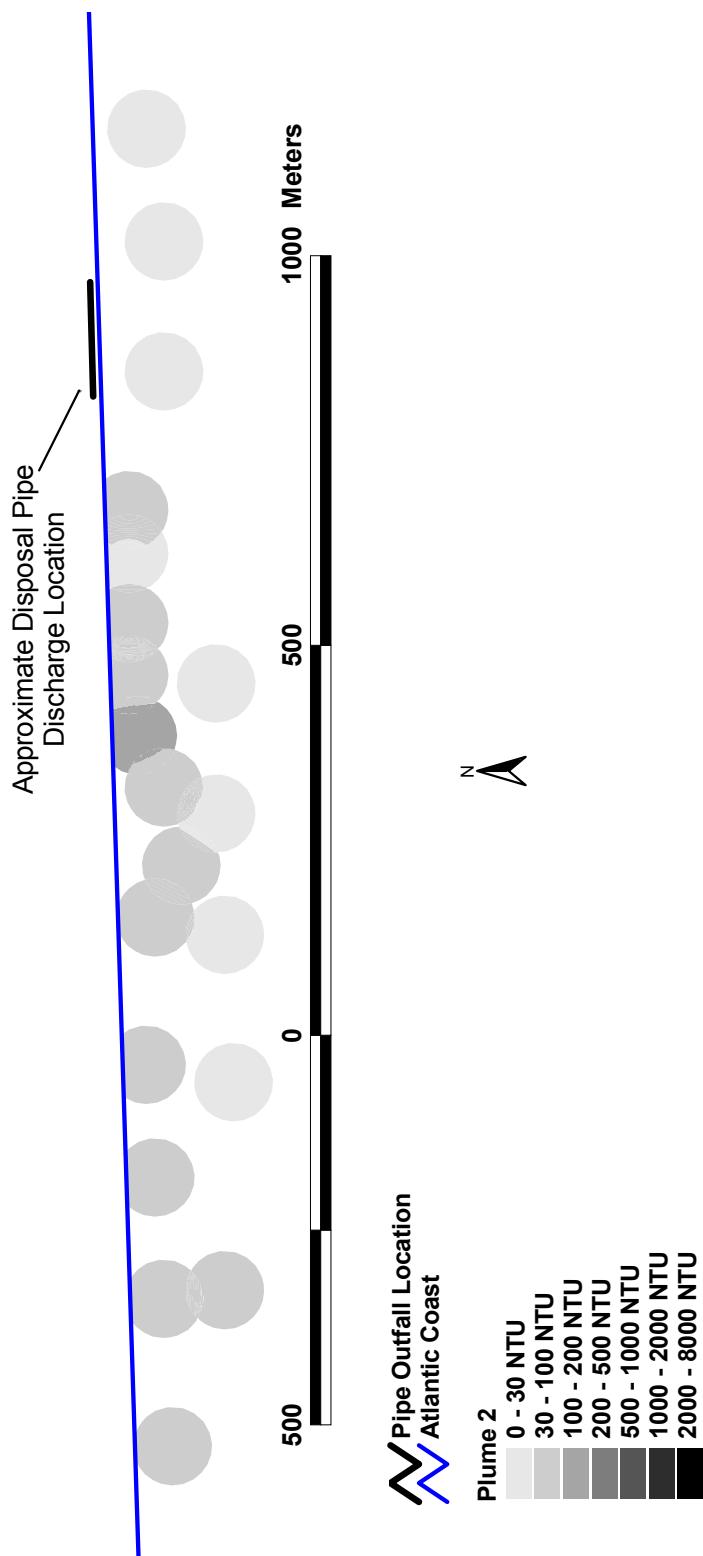


Figure PL-2. Results of turbidity plume mapping on Oak Island conducted on March 11, 2002. Mapping was conducted between 17:20 and 18:20 hours during a flood tide when the wind direction was from the East-North-East.

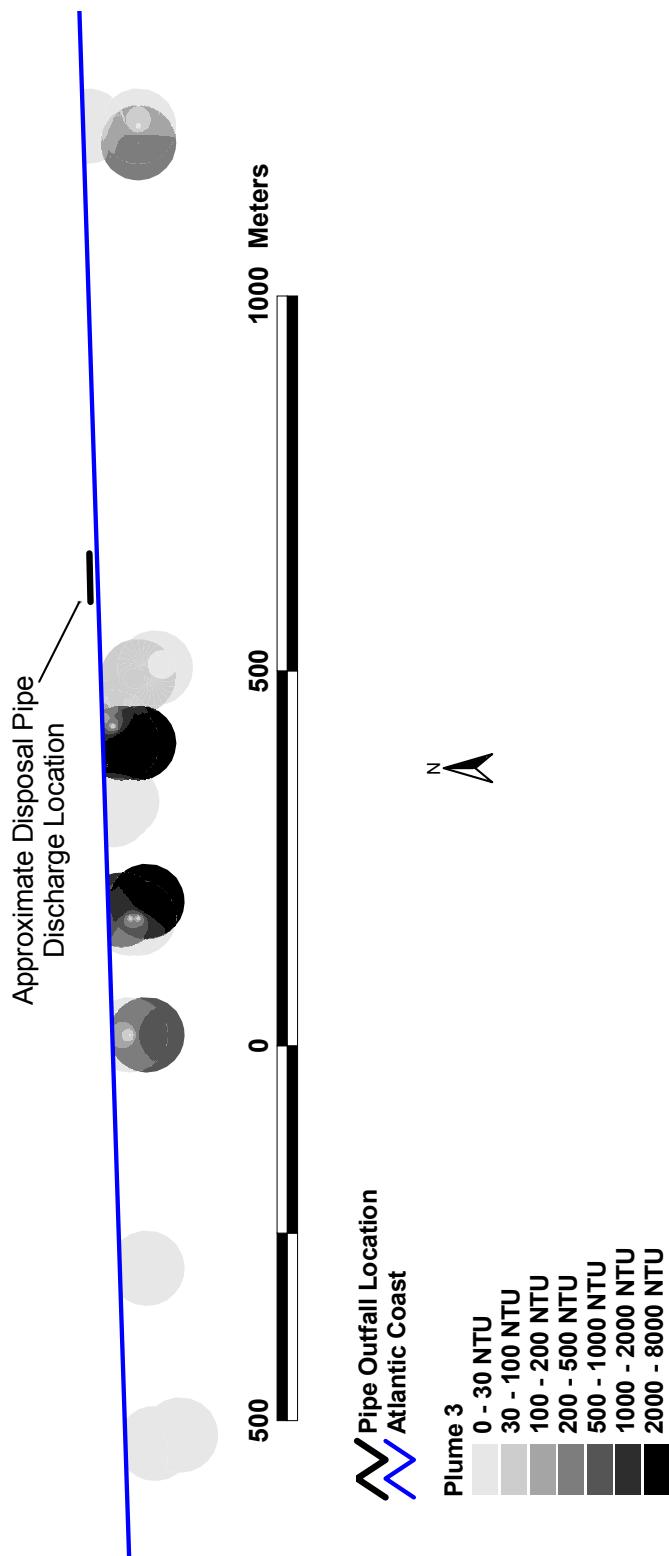


Figure PL-3. Results of turbidity plume mapping on Oak Island conducted on March 14, 2002. Mapping was conducted between 12:00 and 12:40 hours during an ebb tide when the wind direction was from the East-South-East

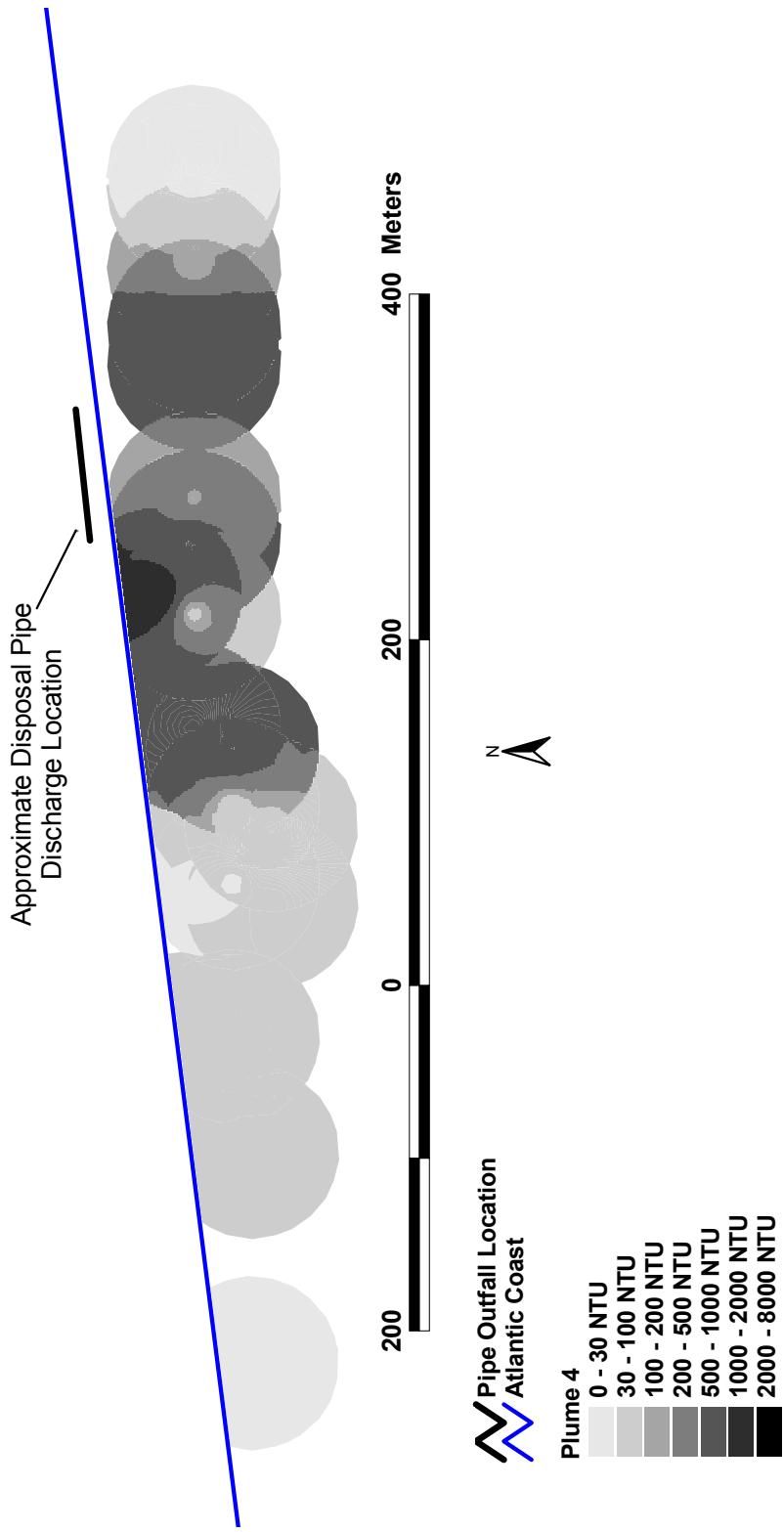


Figure PL-4. Results of turbidity plume mapping on Oak Island conducted on April 16, 2002. Mapping was conducted between 18:00 and 18:45 hours during an ebb tide when the wind direction was from the South.

SEDIMENT GRAIN SIZE

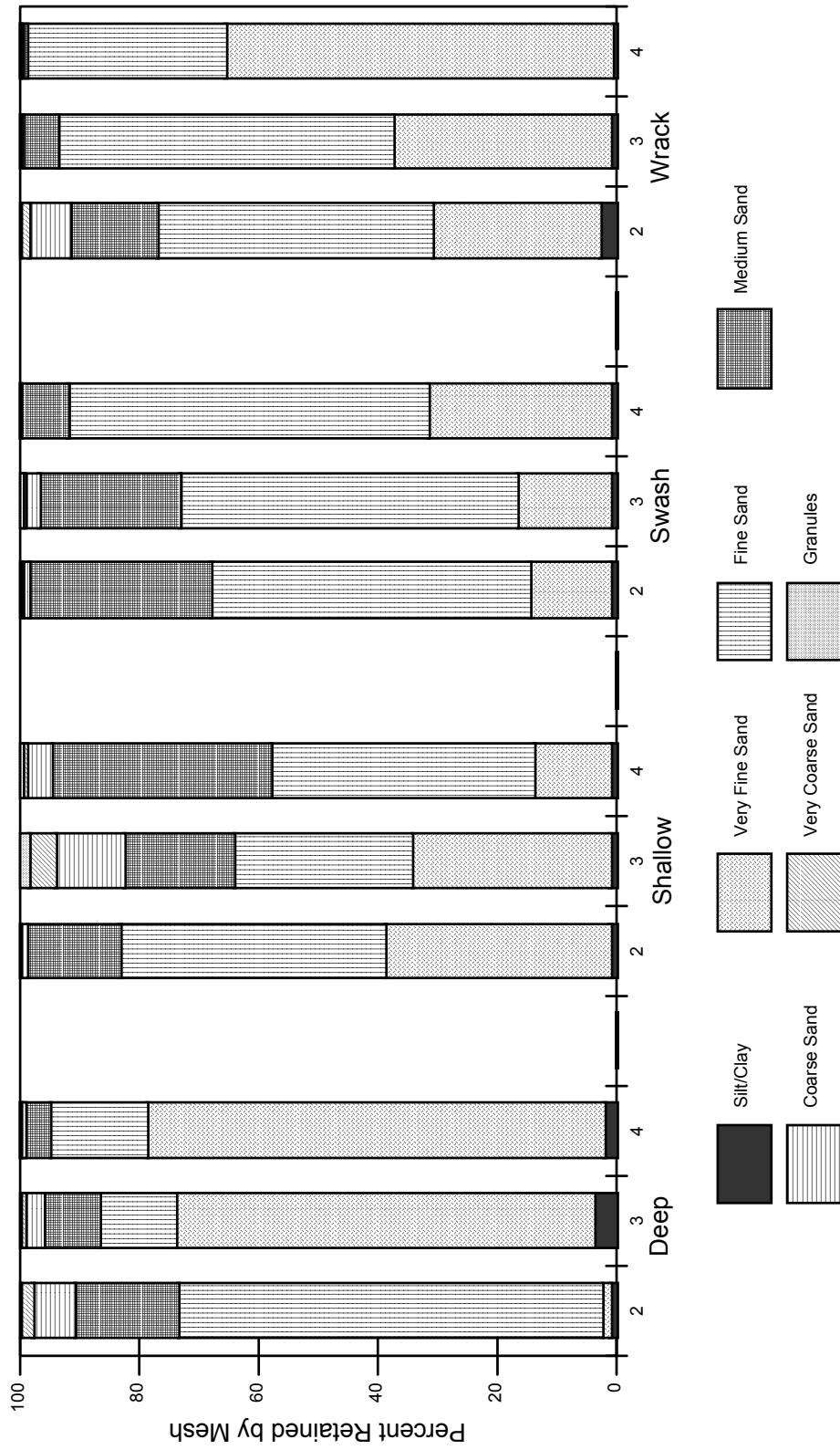


Figure GR-1. Sediment grain size composition of samples collected over four stations for each of the four reference beach habitats located in Holden Beach, NC during the spring period. Samples only taken for Trips 2-4.

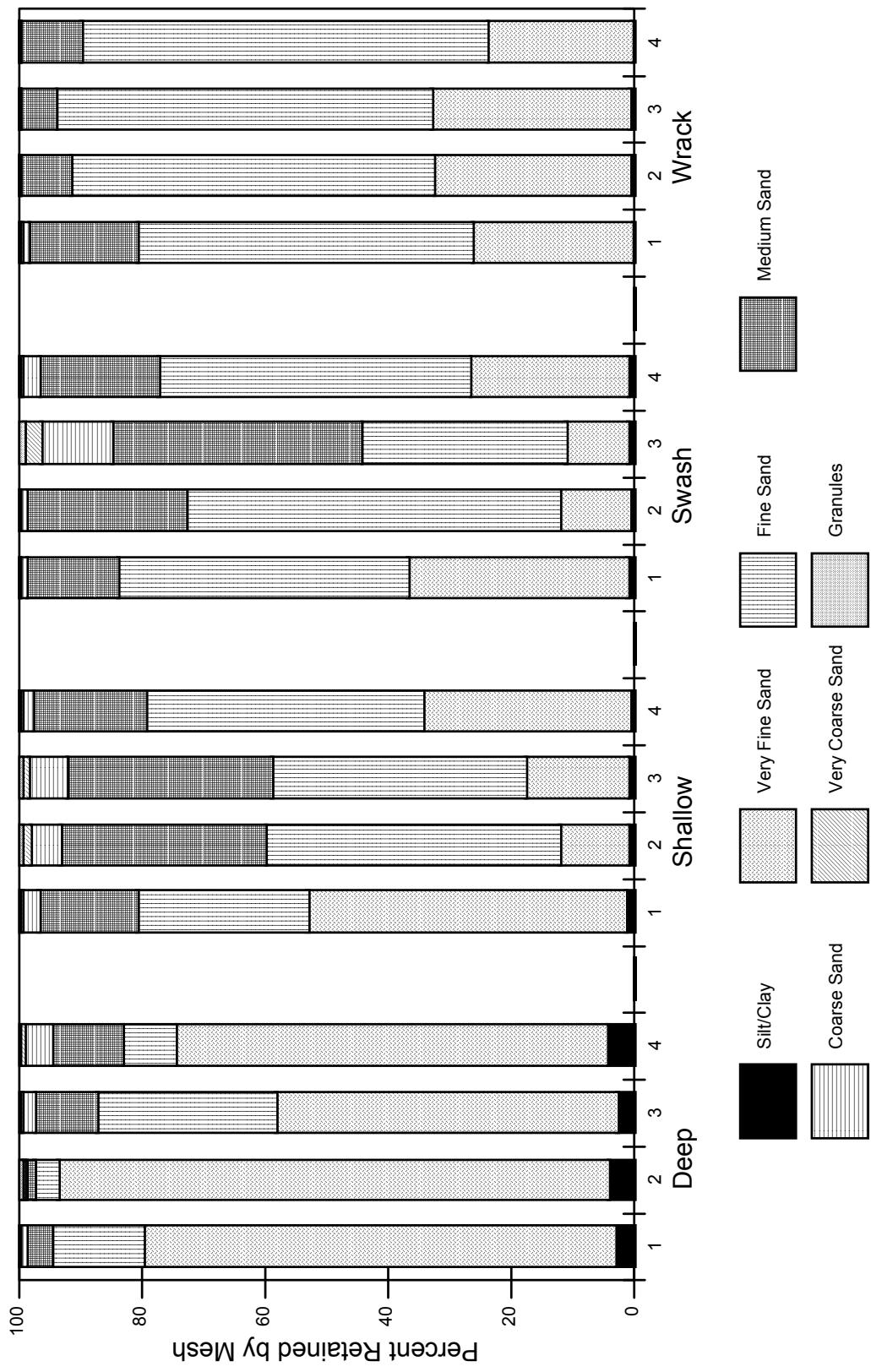


Figure GR-2. Sediment grain size composition of samples collected over four stations for each of the four reference beach habitats located in Holden Beach, NC during the summer period.

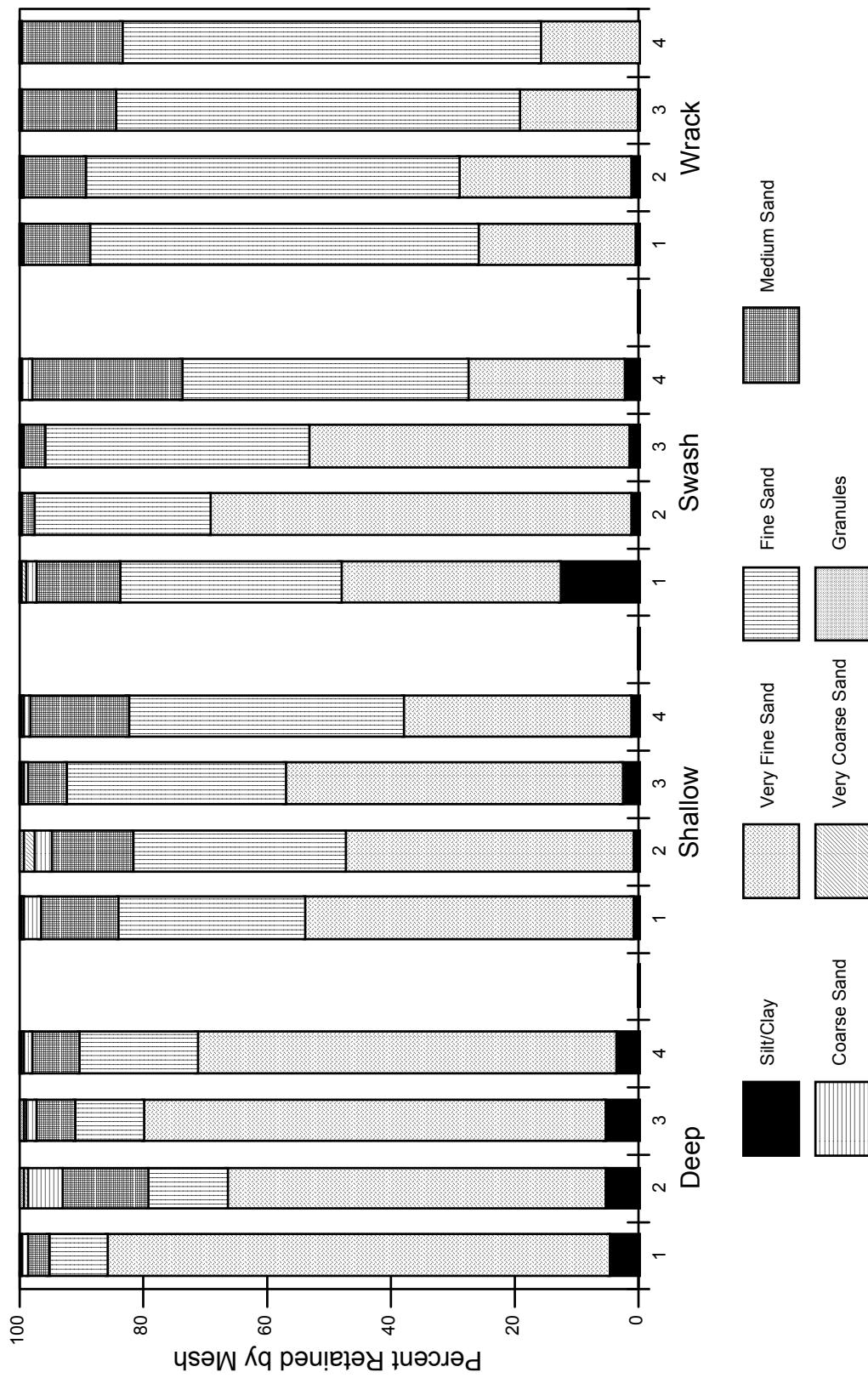


Figure GR-3. Sediment grain size composition of samples collected over four stations for each of the four reference beach habitats located in Holden Beach, NC during the fall period.

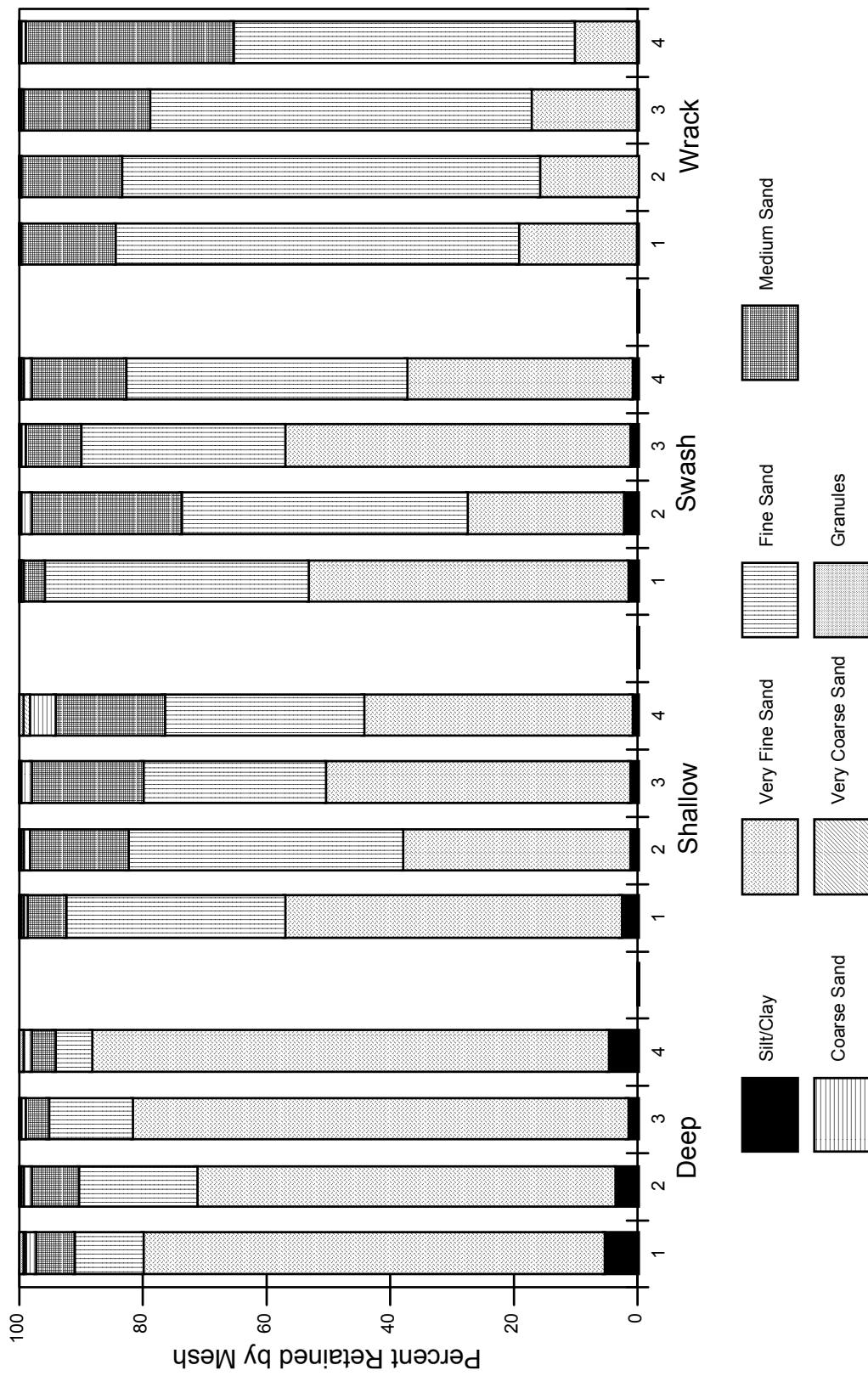


Figure GR-4. Sediment grain size composition of samples collected over four stations for each of the four reference beach habitats located in Holden Beach, NC during the winter period.

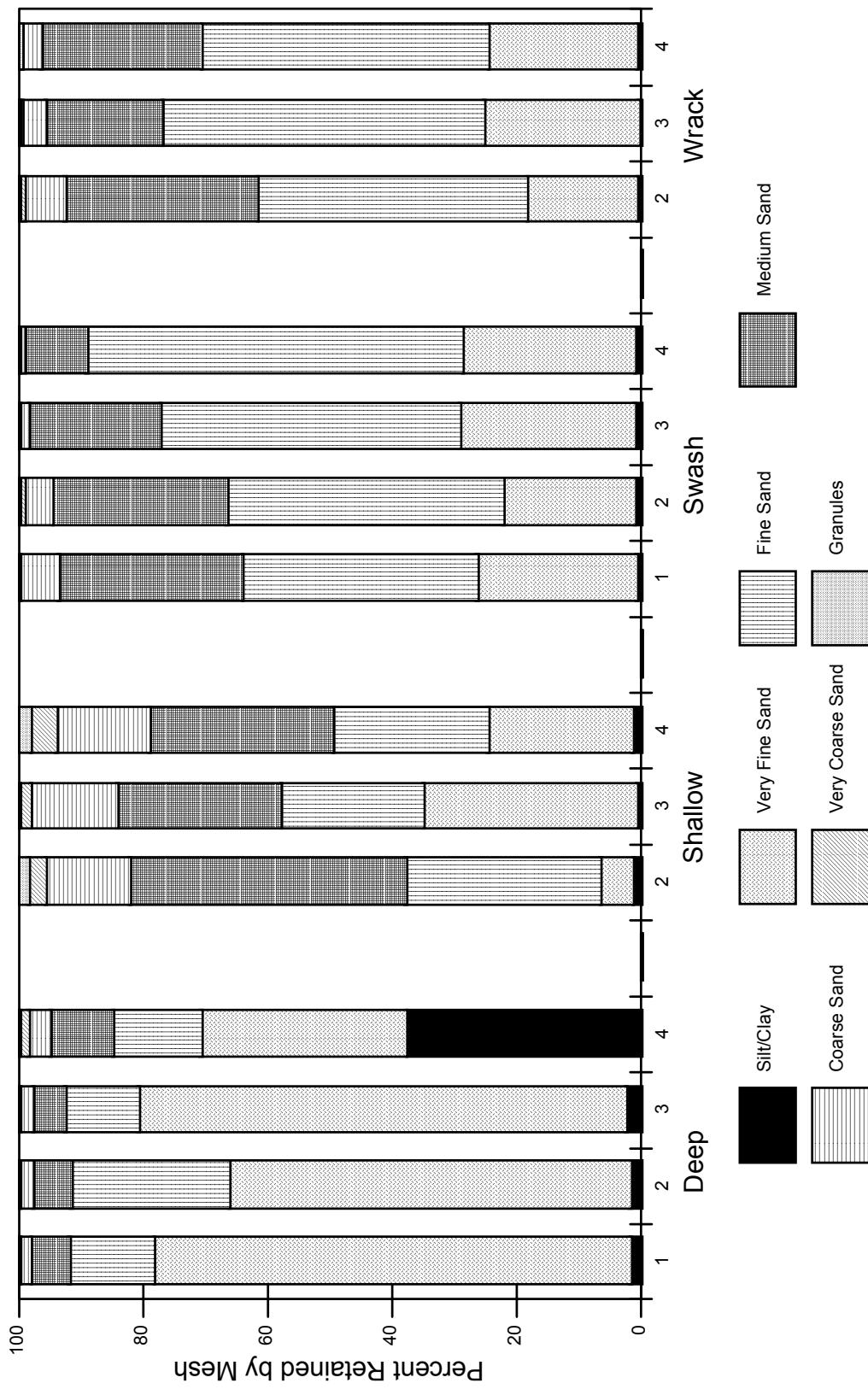


Figure GR-5. Sediment grain size composition of samples collected over eight stations for each of the four undisturbed/disturbed beach habitats in Bald Head Island, NC during the spring period.

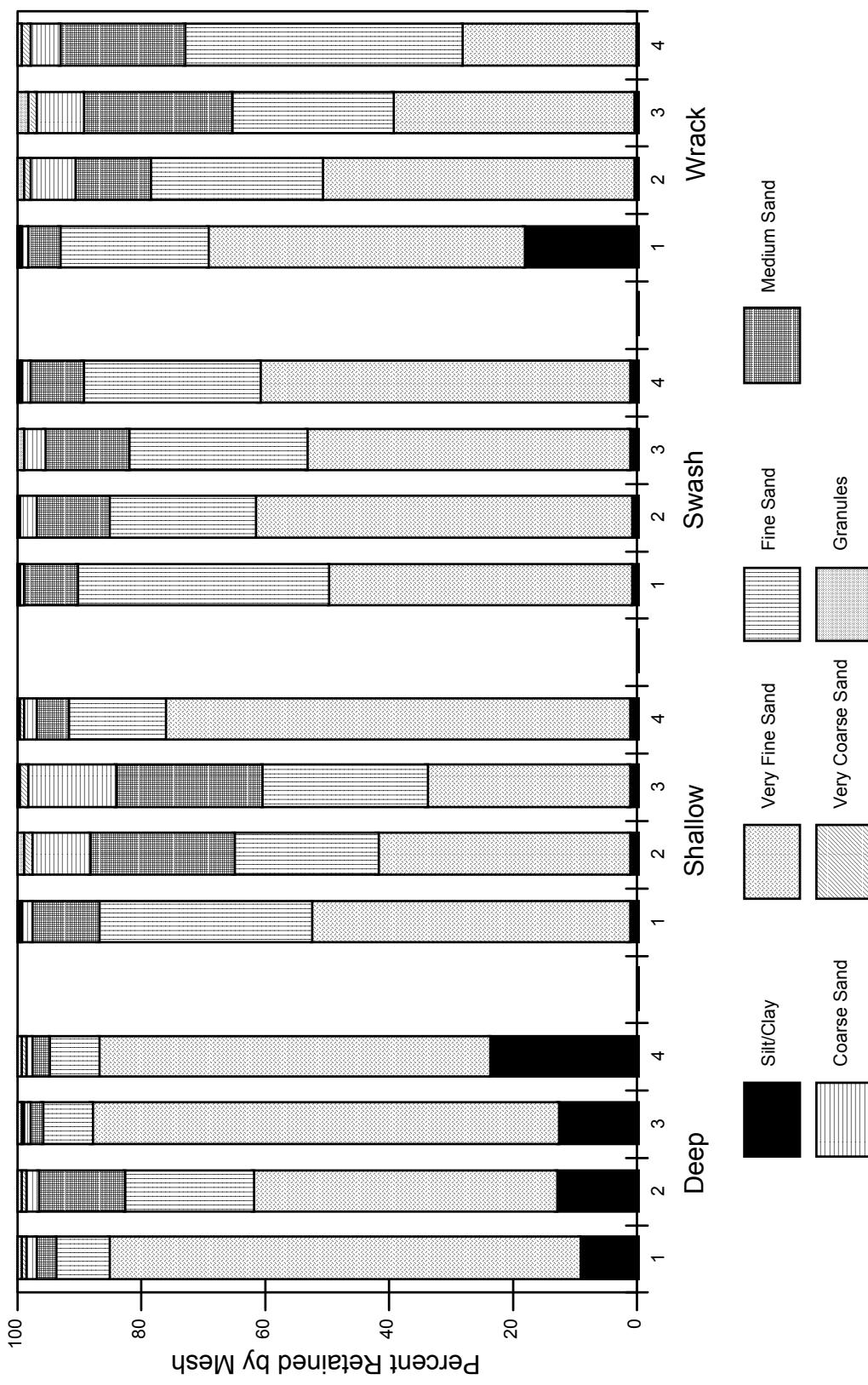


Figure GR-6. Sediment grain size composition of samples collected over eight stations for each of the four undisturbed/disturbed beach habitats located in Caswell Beach, NC during the summer period.

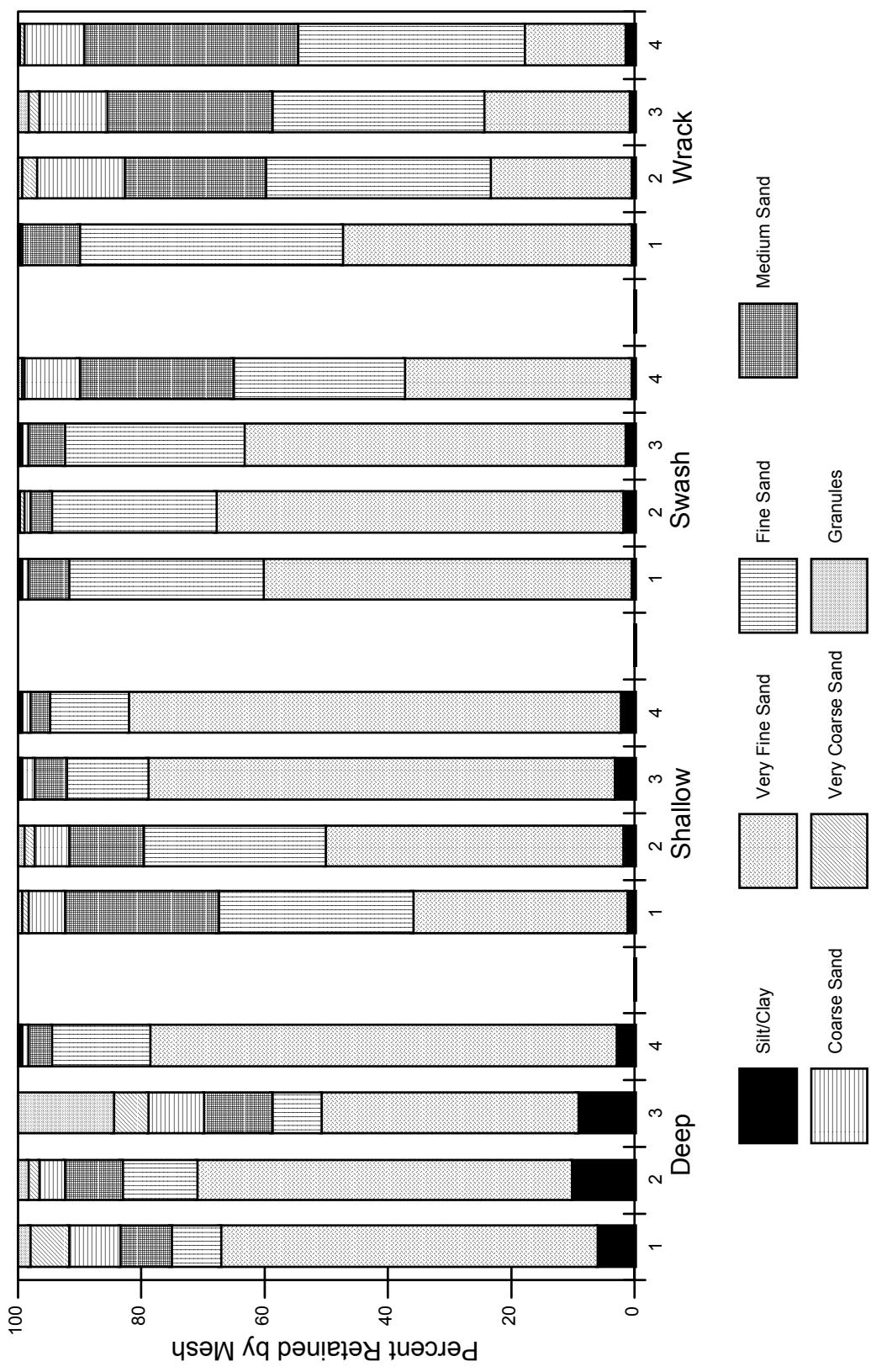


Figure GR-7. Sediment grain size composition of samples collected over eight stations for each of the four undisturbed/disturbed beach habitats located in Oak Island, NC during the fall period.

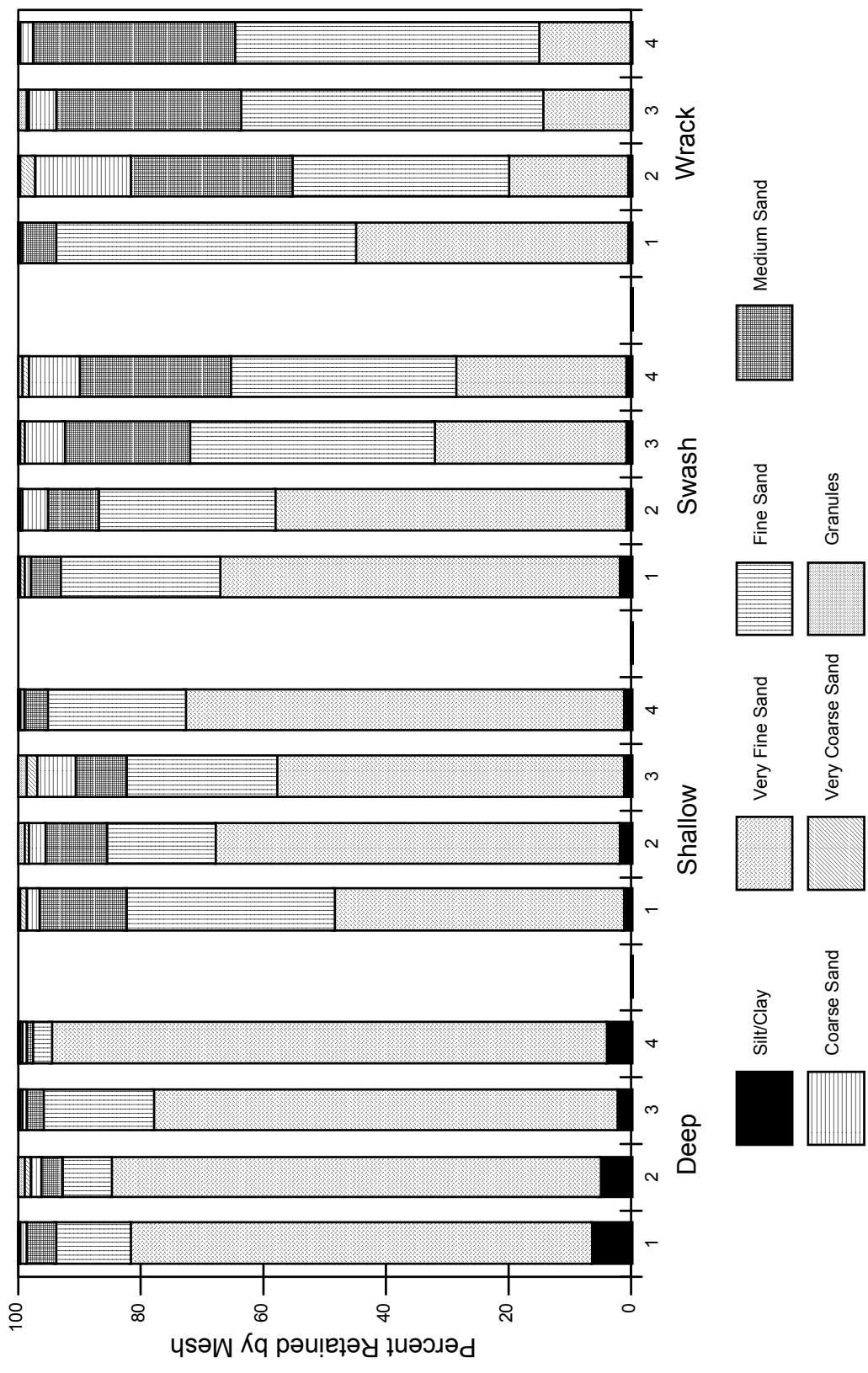


Figure GR-8. Sediment grain size composition of samples collected over eight stations for each of the four undisturbed/disturbed beach habitats located in Holden Beach, NC during the winter period.