DAMOS

DISPOSAL AREA MONITORING SYSTEM

ANNUAL DATA REPORT - 1978

SUPPLEMENT E

BRENTON REEF DISPOSAL SITE

Naval Underwater Systems Center
Newport, Rhode Island

DAMOS
NUSC - CE

New England Division
Corps of Engineers
Waltham, Massachusetts

May 1979

DAMOS

DISPOSAL AREA MONITORING SYSTEM
ANNUAL DATA REPORT - 1978

SUPPLEMENT E
SITE REPORT - BRENTON REEF

Naval Underwater Systems Center
Newport, Rhode Island

New England Division
Corps of Engineers
Waltham, Massachusetts

May 1979

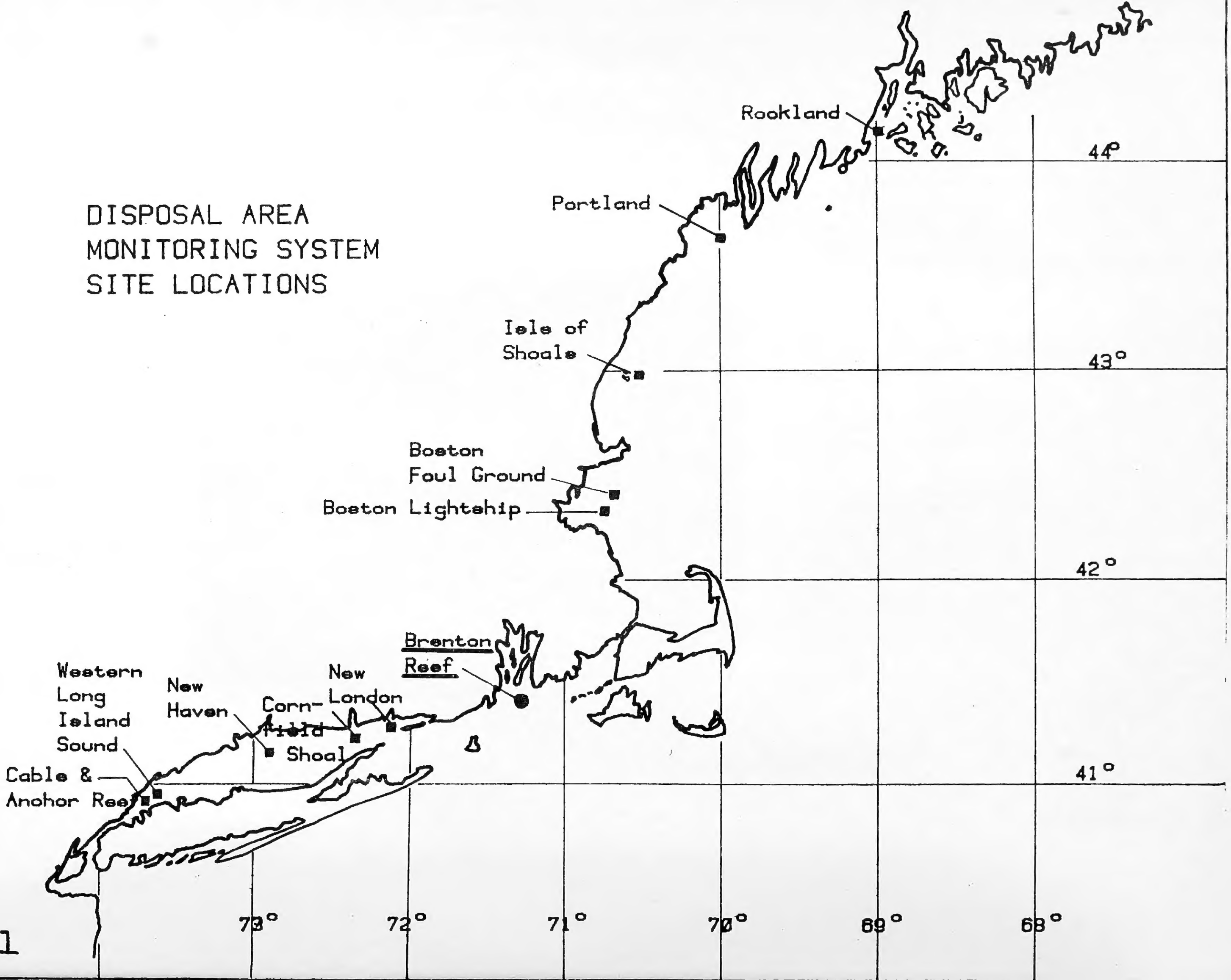

DISPOSAL AREA
MONITORING SYSTEM
SITE LOCATIONS
Rookland
Portland
Isle of Shoals
Boston Foul Ground
Boston Lightship
Brenton Reef
New London
Corn-field Shoal
New Haven
Western Long Island Sound
Cable & Anchor Reef
44°
43°
42°
41°
73°
72°
71°
70°
69°
68°

FIG.-1

DISPOSAL AREA MONITORING SYSTEM

This is one of a series of site specific data reports resulting from the DAMOS program, now two years in progress. DAMOS is the culmination of nearly a decade of prior study efforts, actually preceding NEPA, which have been directed towards the understanding of the effects of and the responsible management of the ocean disposal of dredged materials in New England waters as they fall under the authority ot the New England Division of the Corps of Engineers. The individual site reports henceforth will be updated approximately on an annual bases as additional knowledge is gained, at least with respect to those sites where significant disposal activities will have occurred.

BRENTON REEF DISPOSAL SITE

The Brenton Reef disposal site (Fig. E-1) was used primarily between 1967 and 1971 as the disposal area for dredging of the Providence River. Since the completion of that job, no spoils have been placed on the site and it therefore provides an opportunity to examine longer term effects of spoil disposal.

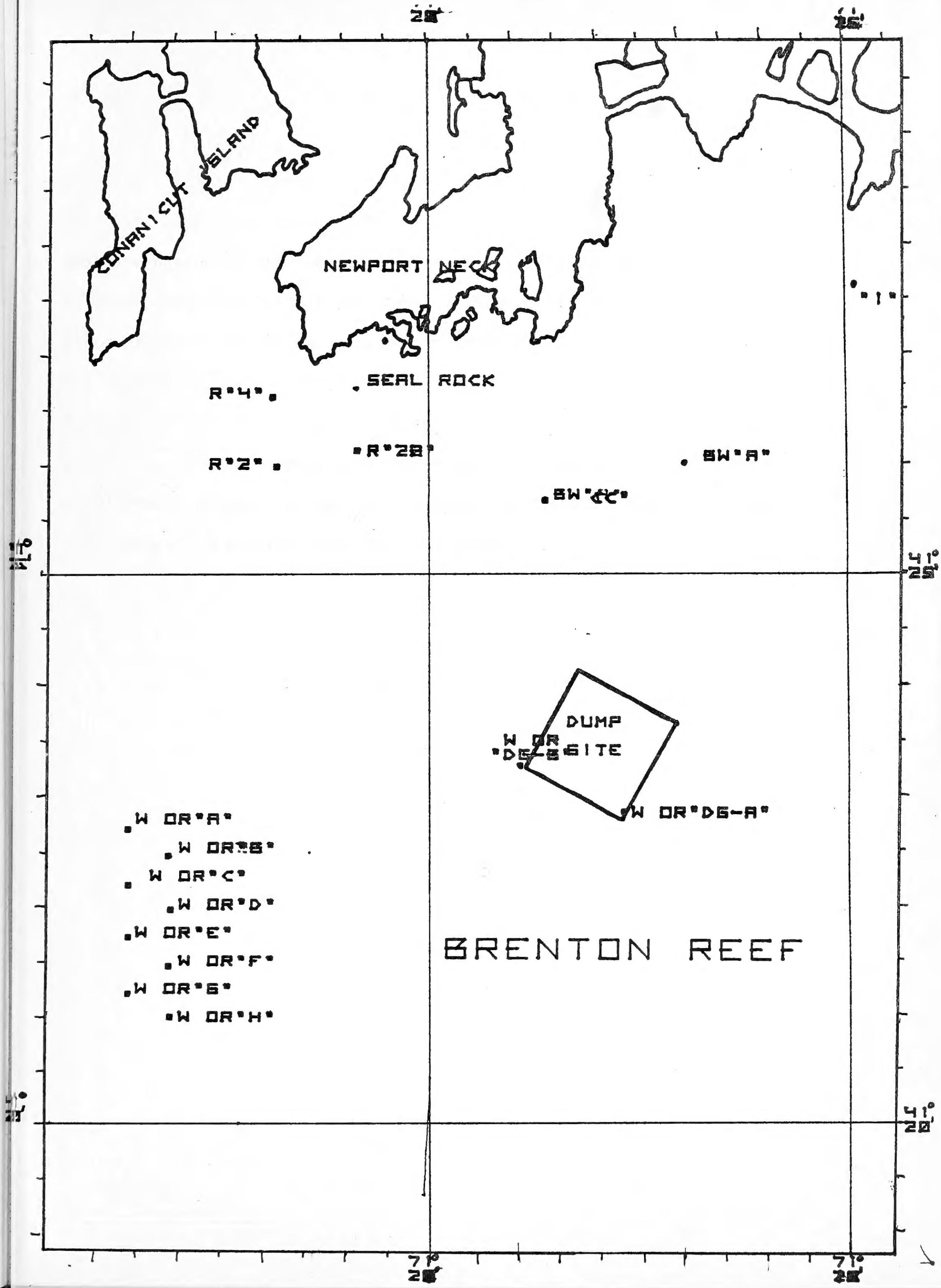
Bathymetry

The first survey at Brenton Reef conducted under the DAMOS program was unsuccessful due to problems relating to set up of baseline and other navigation criteria during the survey operation. However, the second survey in August, 1978 (Fig. E-2(a-1)) was successful and defined the spoil mound as a gentle rise covering the western half of the disposal area. The southeast slope of this mound is much steeper than the slope to the north, probably as a result of spillage and short dumping from scows. Spoil can be found shoreward of the site indicating this has occurred.

The top of the spoil mound has a sand surface layer, covering silty spoil material, but the flanks have exposed mud and spoils below 29 meters. Whether this sand layer is a depositional feature or a lag deposit from spoil erosion is a question of some controversy at this time. Future work under the DAMOS program will be oriented toward resolving this question, however, regardless of its origin, the sand now serves as a cap over the spoils.

Currents

Current data were obtained at the Brenton Reef site for only a short period from 25 April to 15 May, 1978 and most of these data are inadequate for valid interpretation. A speed-direction plot (Fig. E-3(a-b)) indicates that problems similar to those incountered at the Boston Foul Ground occurred here, such that direction data are invalid and speed may be considered suspect. Diver observations of the meter showed that the tether was tangled in the mooring line hence


CONANICUT ISLAND
NEWPORT NECK
SEAL ROCK
R"4"
R"2"
R"28"
BW"A"
BW"CC"
"1"
41°
25'
41°
20'
71°
DUMP
SITE
W OR
"DS-B"
W OR"DS-A"
W OR"A"
W OR"B"
W OR"C"
W OR"D"
W OR"E"
W OR"F"
W OR"G"
W OR"H"
BRENTON REEF

BRENTON REEF DISPOSAL SITE

The Brenton Reef disposal site (Fig. E-1) was used primarily between 1967 and 1971 as the disposal area for dredging of the Providence River. Since the completion of that job, no spoils have been placed on the site and it therefore provides an opportunity to examine longer term effects of spoil disposal.

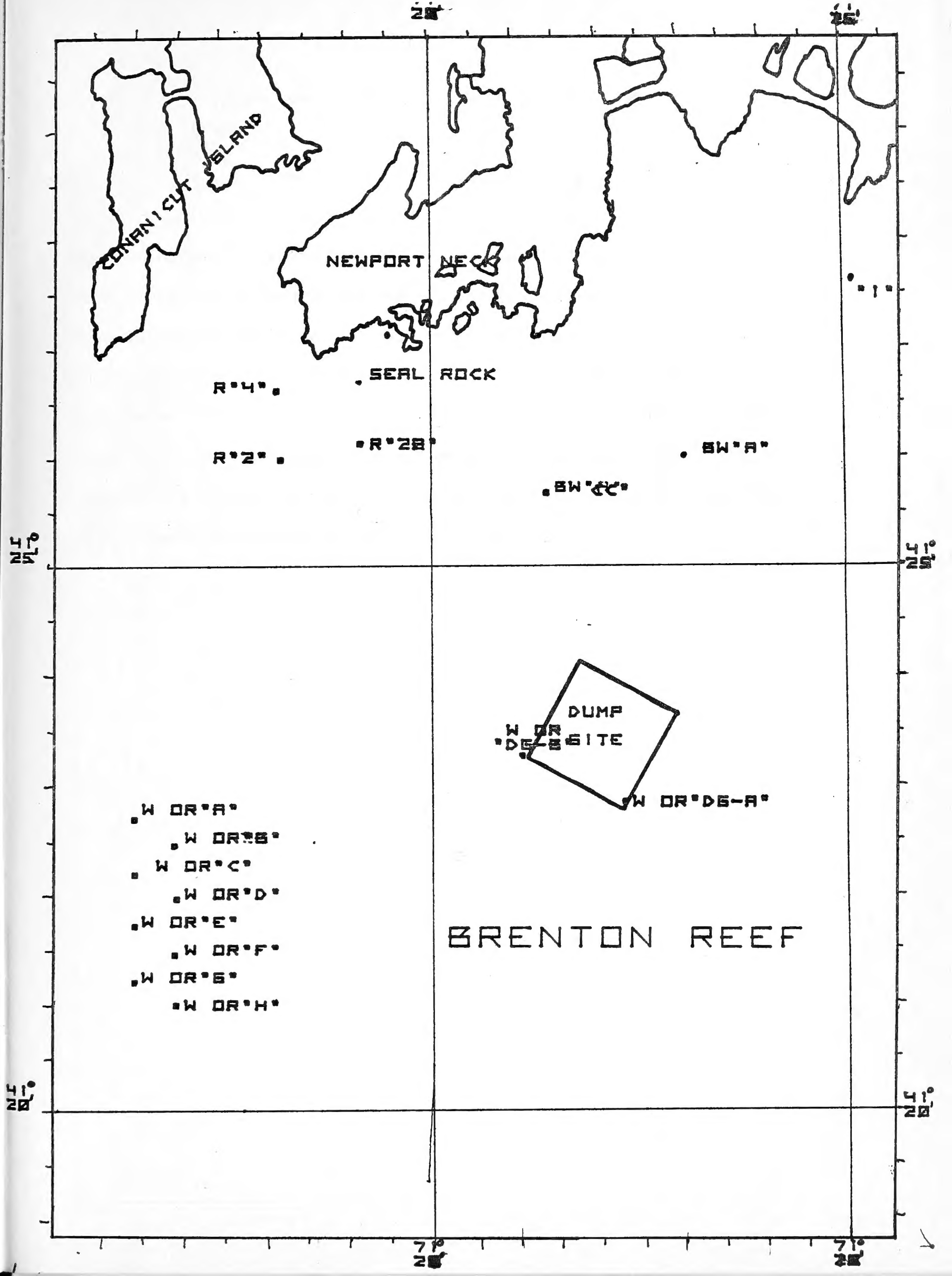
Bathymetry

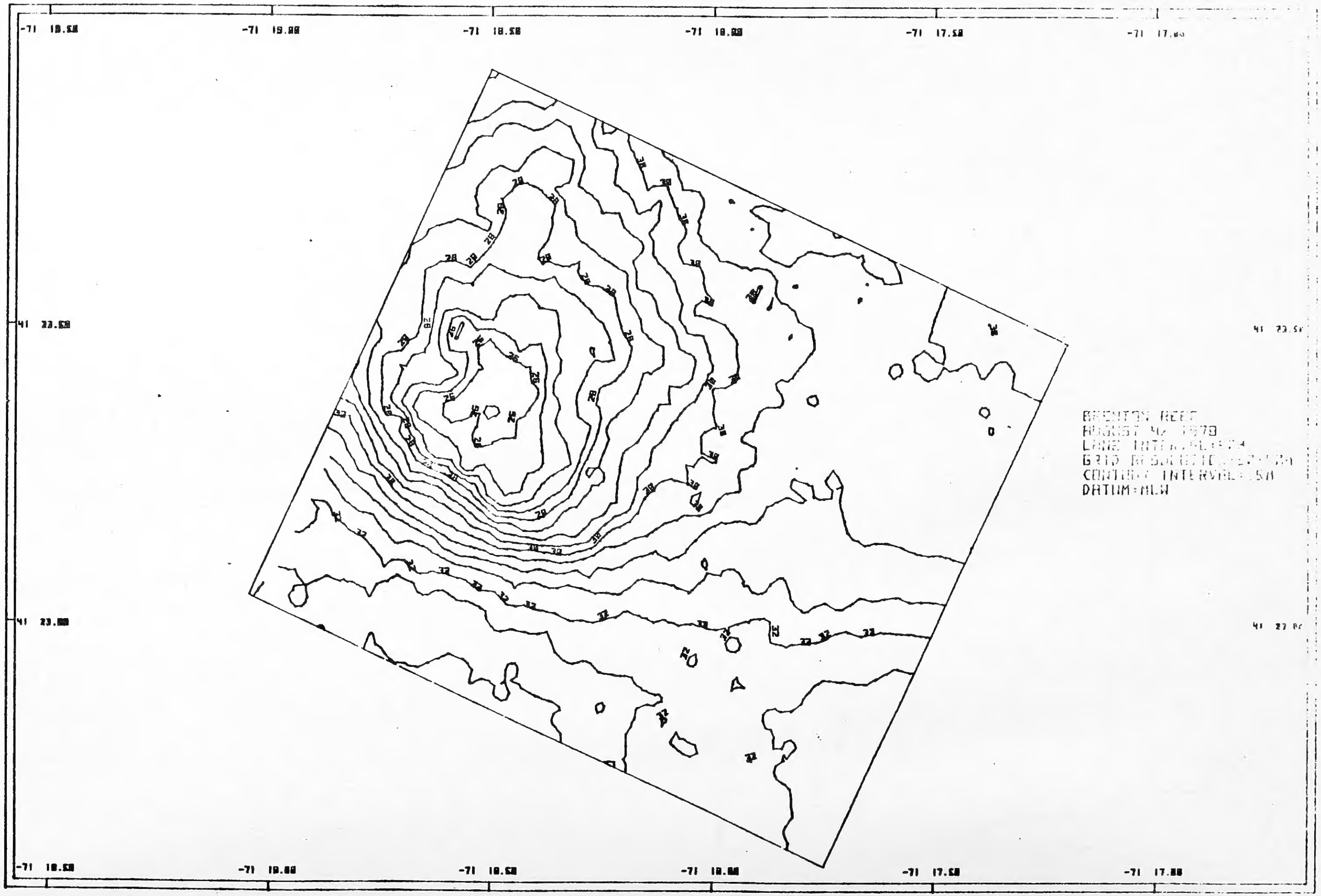
The first survey at Brenton Reef conducted under the DAMOS program was unsuccessful due to problems relating to set up of baseline and other navigation criteria during the survey operation. However, the second survey in August, 1978 (Fig. E-2(a-1)) was successful and defined the spoil mound as a gentle rise covering the western half of the disposal area. The southeast slope of this mound is much steeper than the slope to the north, probably as a result of spillage and short dumping from scows. Spoil can be found shoreward of the site indicating this has occurred.

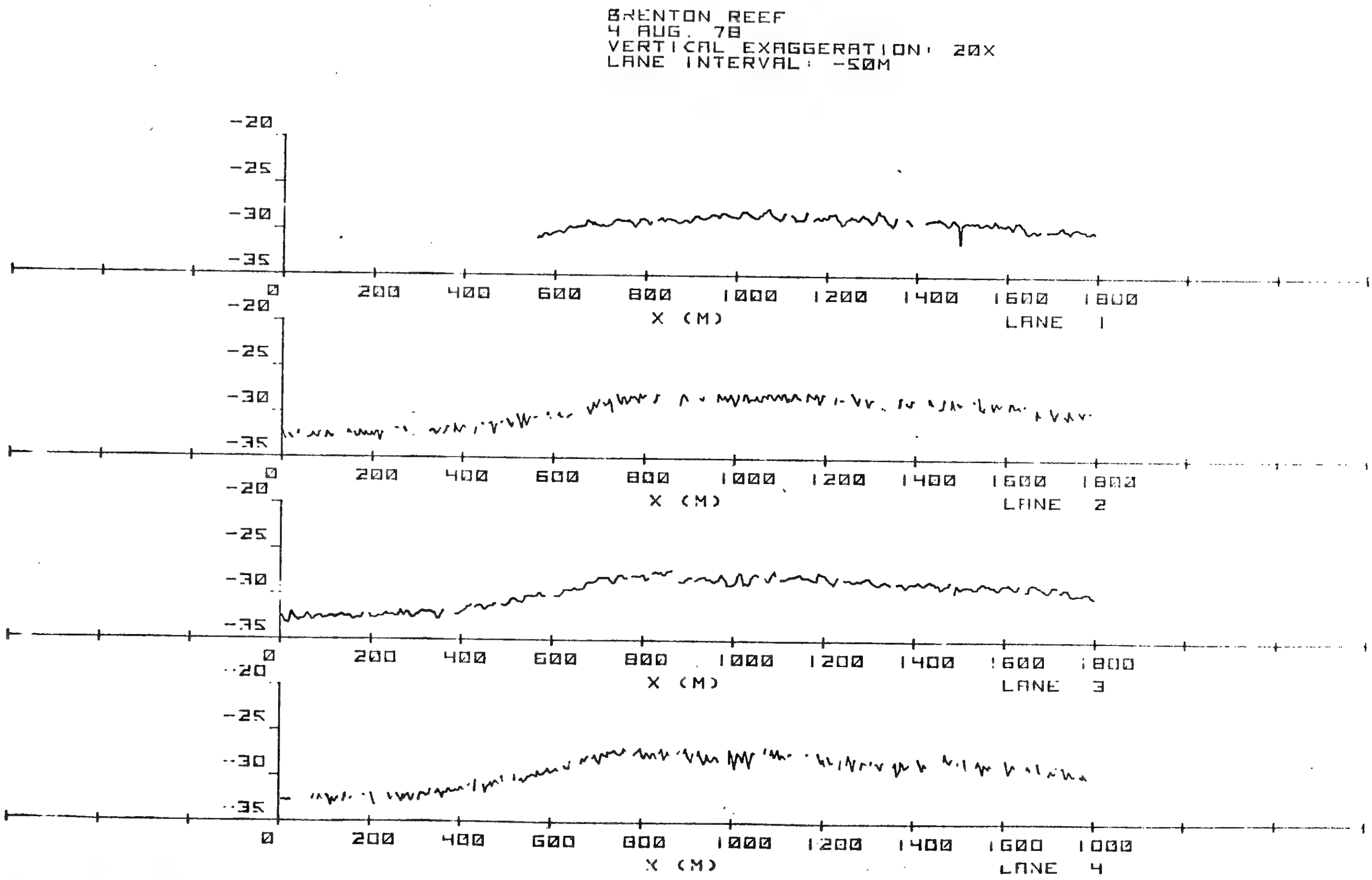
The top of the spoil mound has a sand surface layer, covering silty spoil material, but the flanks have exposed mud and spoils below 29 meters. Whether this sand layer is a depositional feature or a lag deposit from spoil erosion is a question of some controversy at this time. Future work under the DAMOS program will be oriented toward resolving this question, however, regardless of its origin, the sand now serves as a cap over the spoils.

Currents

Current data were obtained at the Brenton Reef site for only a short period from 25 April to 15 May, 1978 and most of these data are inadequate for valid interpretation. A speed-direction plot (Fig. E-3(a-b)) indicates that problems similar to those incountered at the Boston Foul Ground occurred here, such that direction data are invalid and speed may be considered suspect. Diver observations of the meter showed that the tether was tangled in the mooring line hence

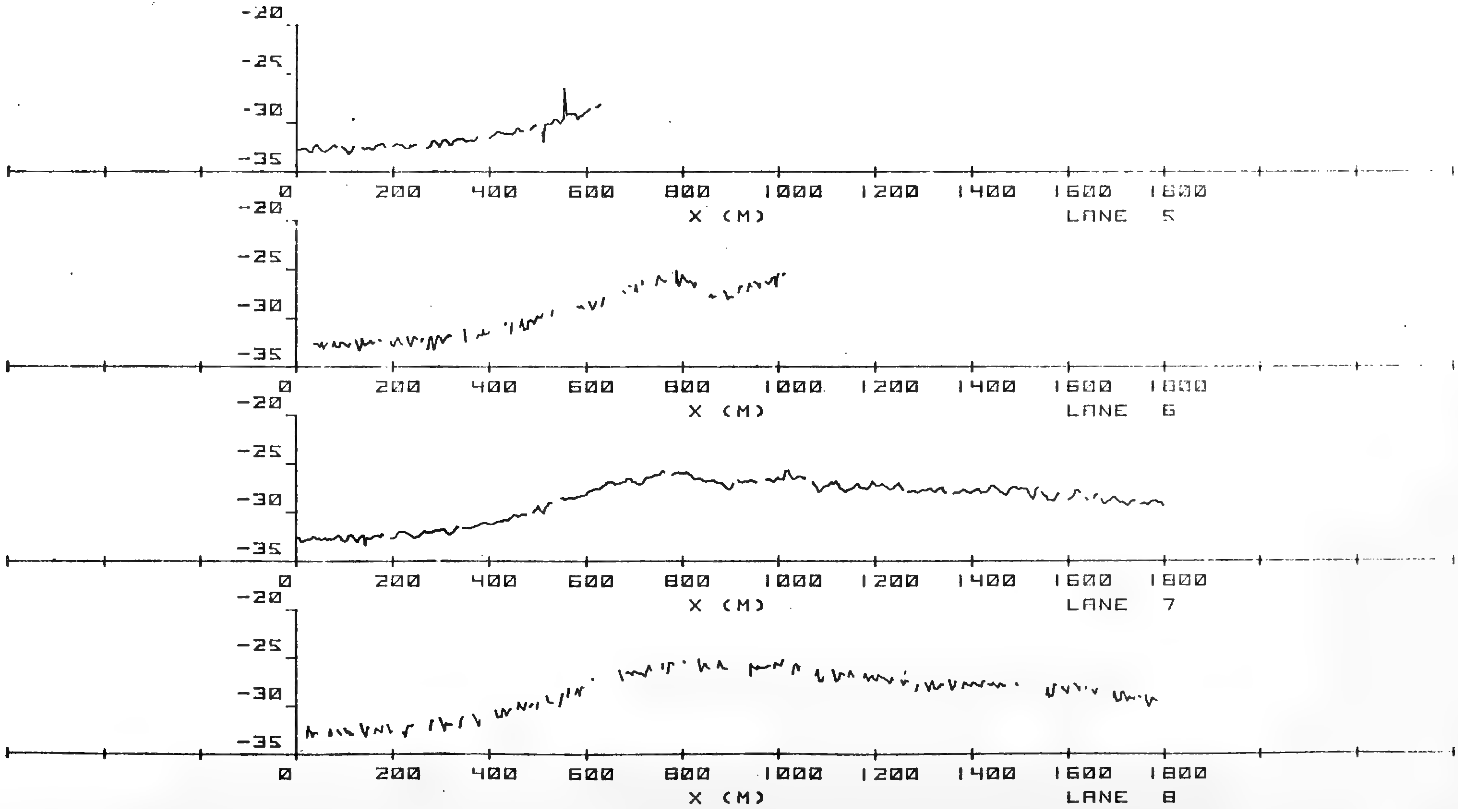

CONANICUT ISLAND
NEWPORT NECK
SEAL ROCK
R "4"
R "2"
R "2B"
BW "A"
BW "CC"
"1"
DUMP SITE
W OR "DG-B"
W OR "DG-A"
W OR "A"
W OR "B"
W OR "C"
W OR "D"
W OR "E"
W OR "F"
W OR "G"
W OR "H"
BRENTON REEF
41° 25'
41° 20'
71° 20'
25'


-71 18.50
-71 19.00
-71 18.50
-71 18.00
-71 17.50
-71 17.00
41 23.50
41 23.00
28
26
32
BRENTON REEF
1978
GRID
CONTOUR INTERVAL .5M
DATUM:MLW



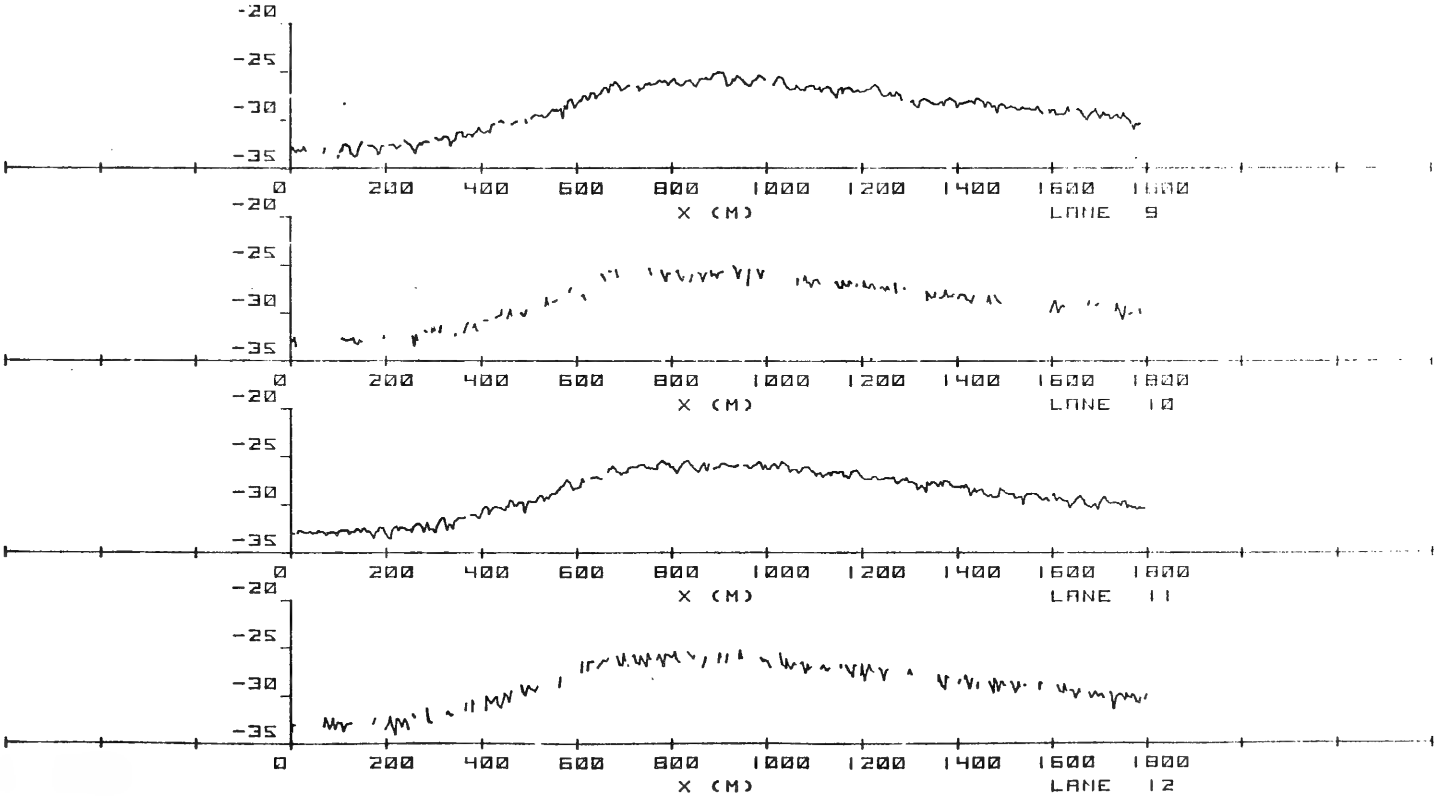
BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M
-20
-25
-30
-35
0
200
400
600
800
1000
1200
1400
1600
1800
X (M)
LANE 1
LANE 2
LANE 3
LANE 4

BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M



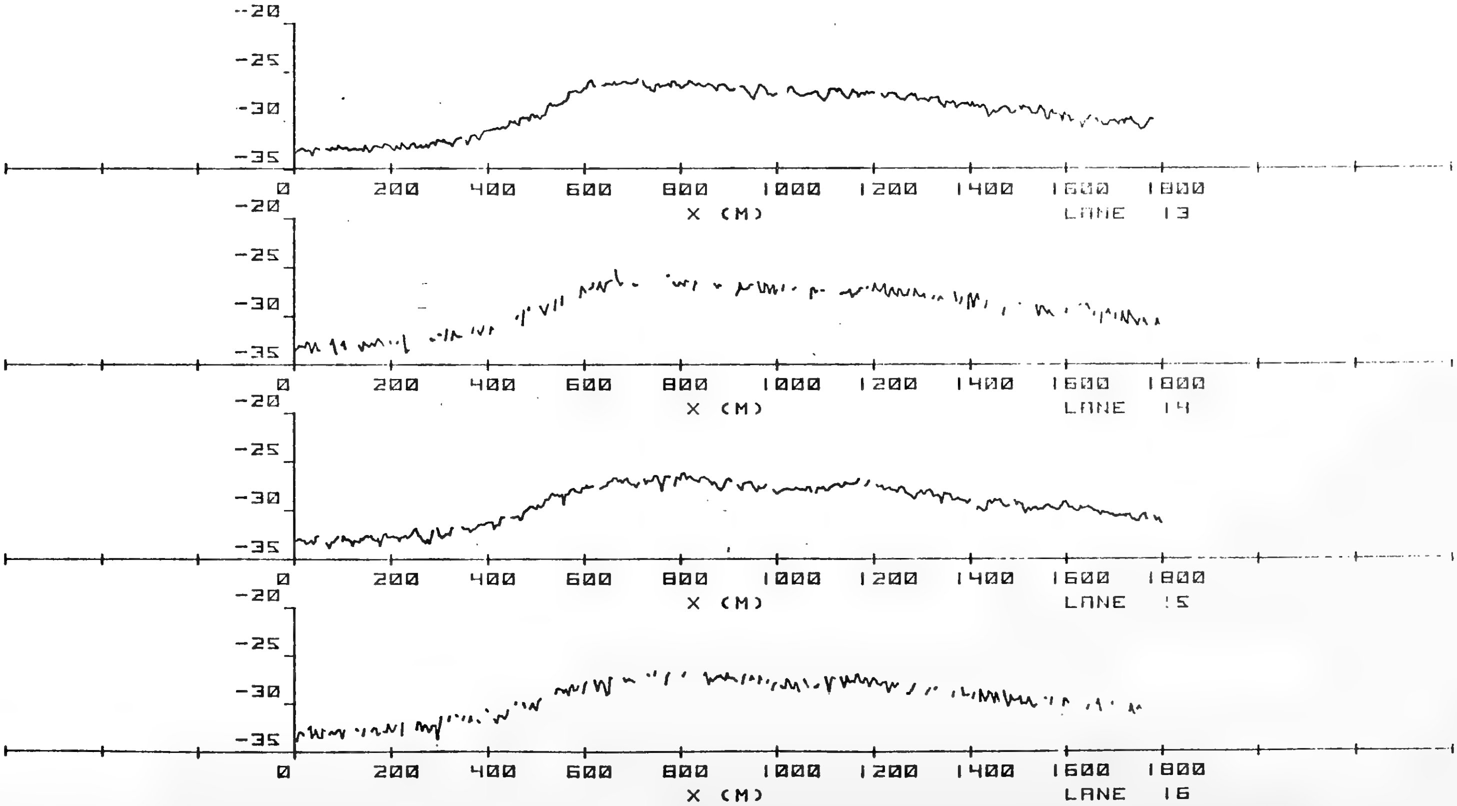
E-2c

BRENTON REEF
4 AUG 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M



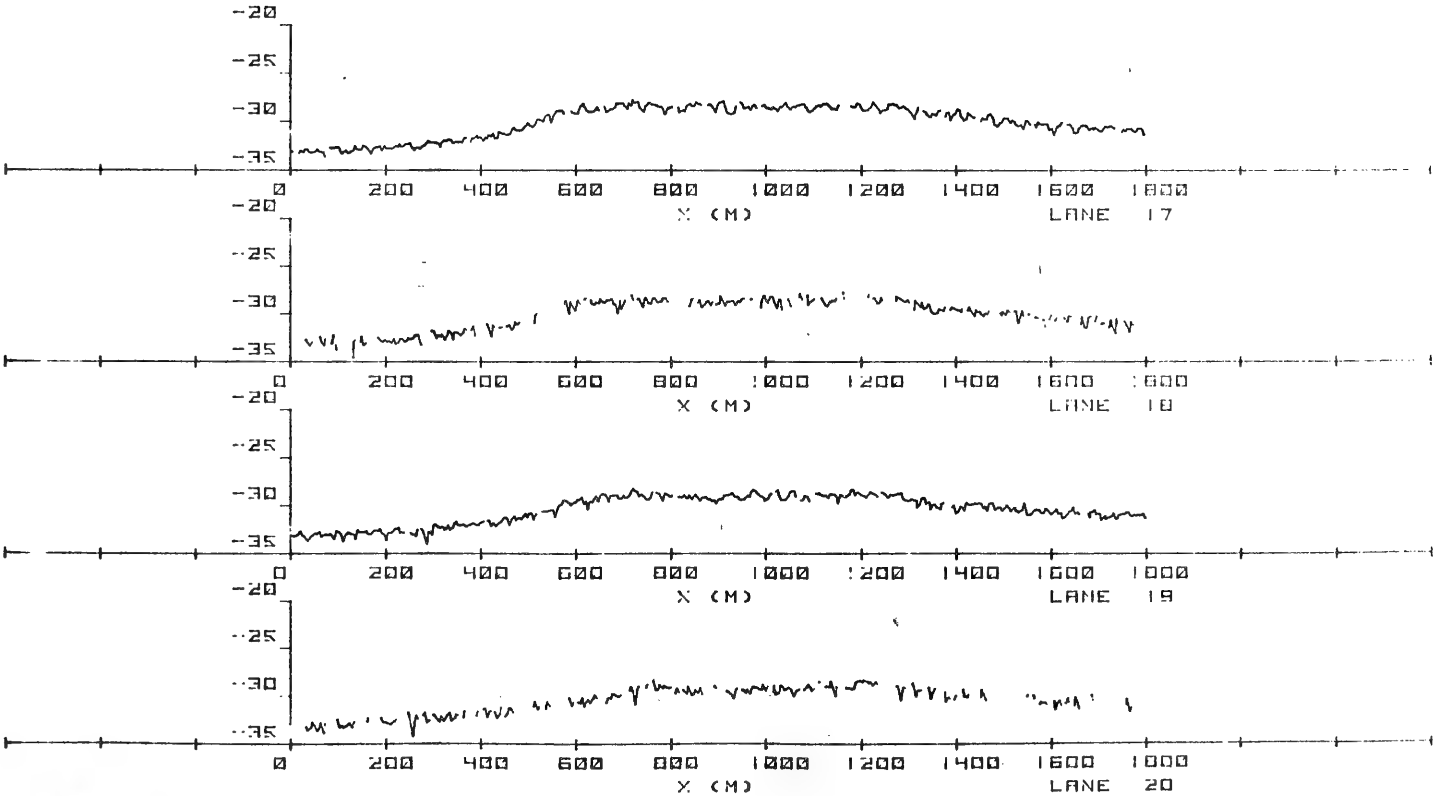
E-2d

BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M



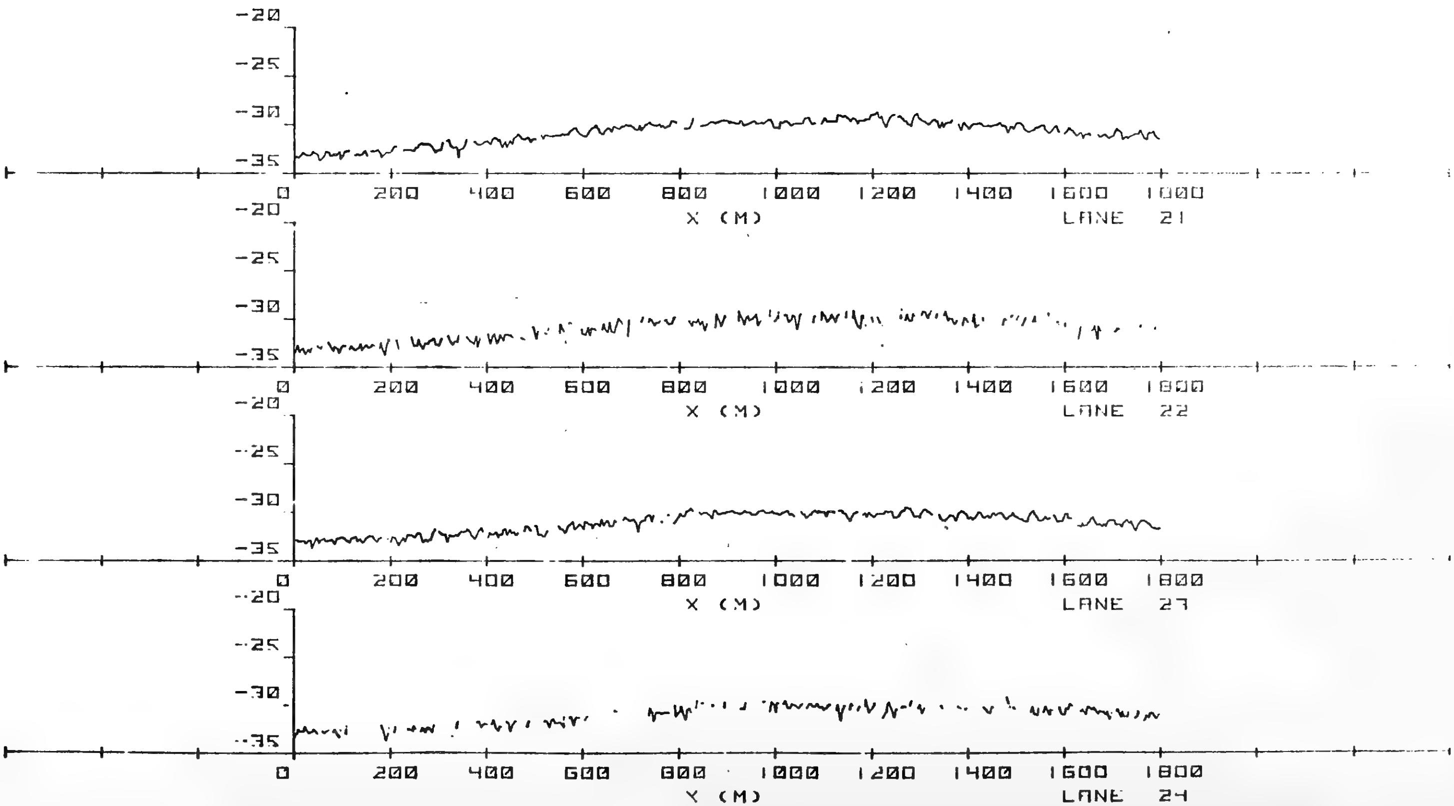
E-2Q

BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M

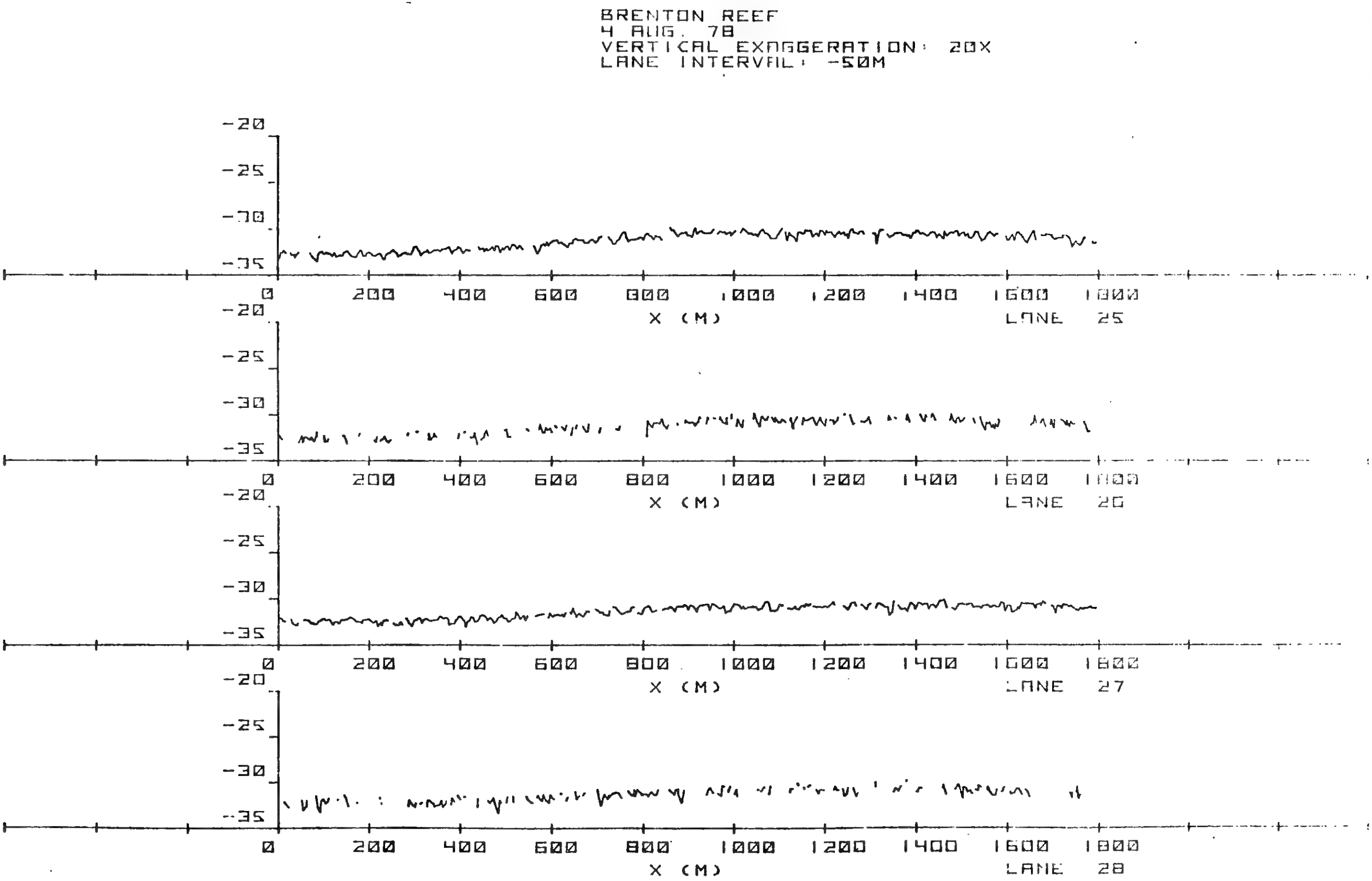


E-2f

BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M

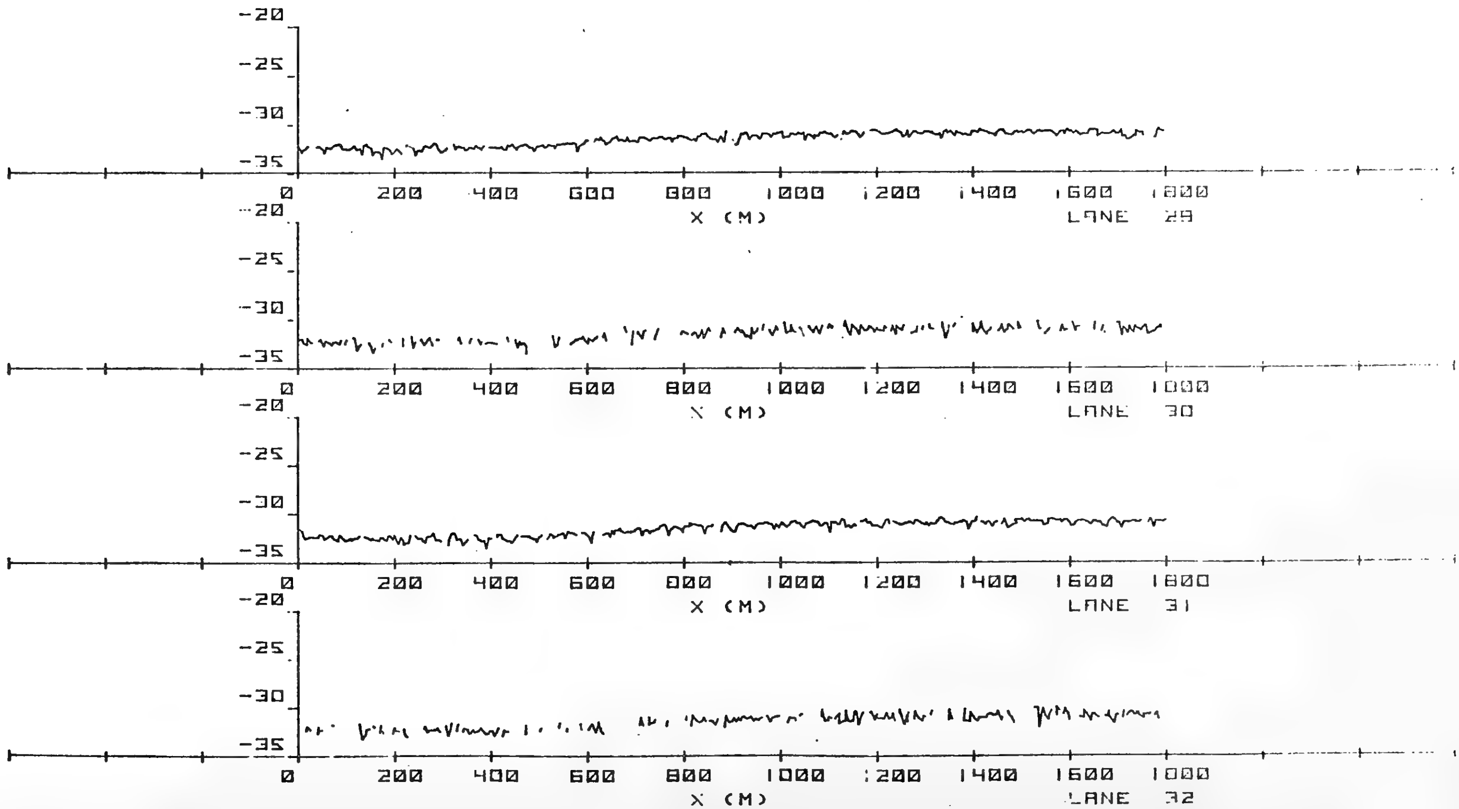


E-2g

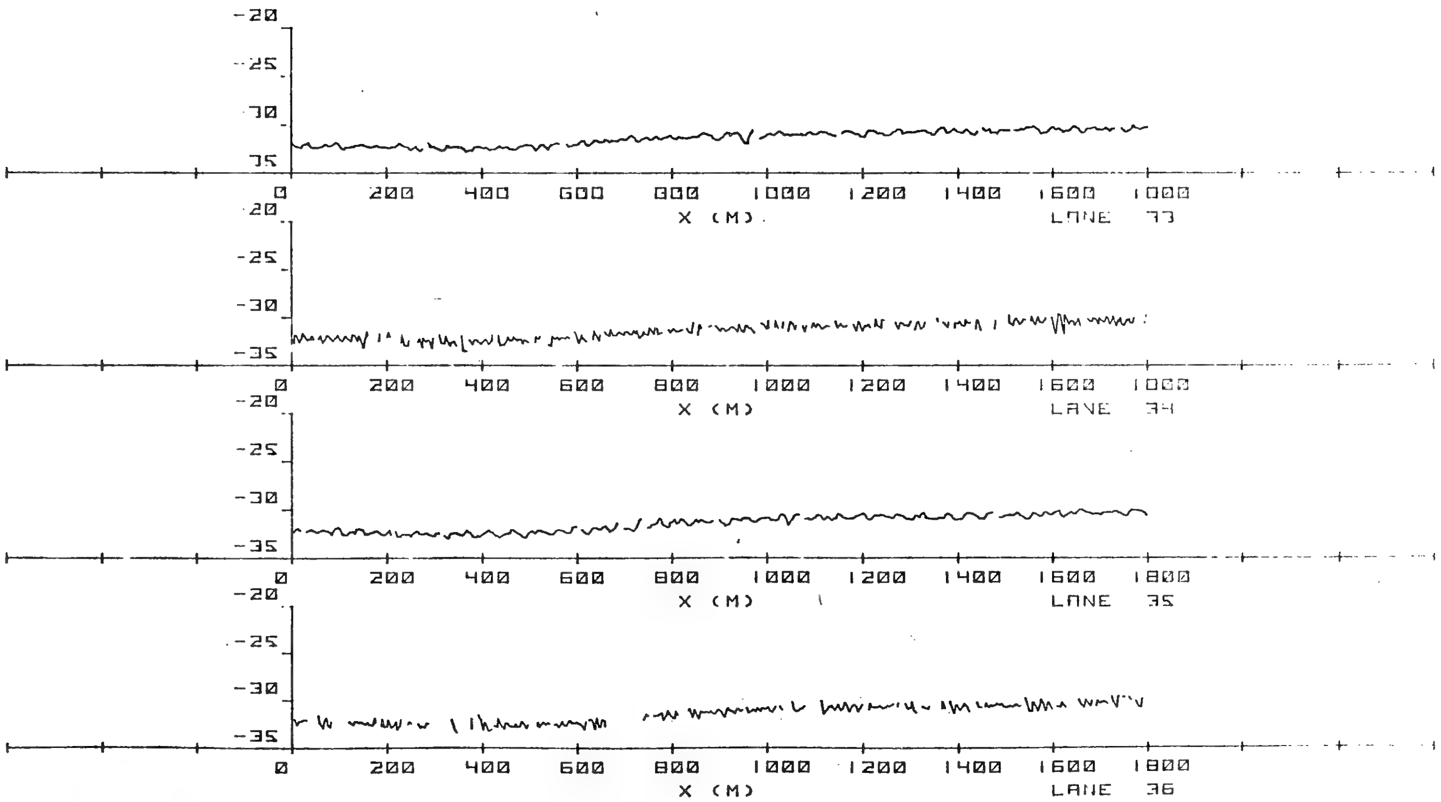

BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M
-20
-25
-30
-35
0
200
400
600
800
1000
1200
1400
1600
1800
X (M)
LANE 25
LANE 26
LANE 27
LANE 28

E-2 A

BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M

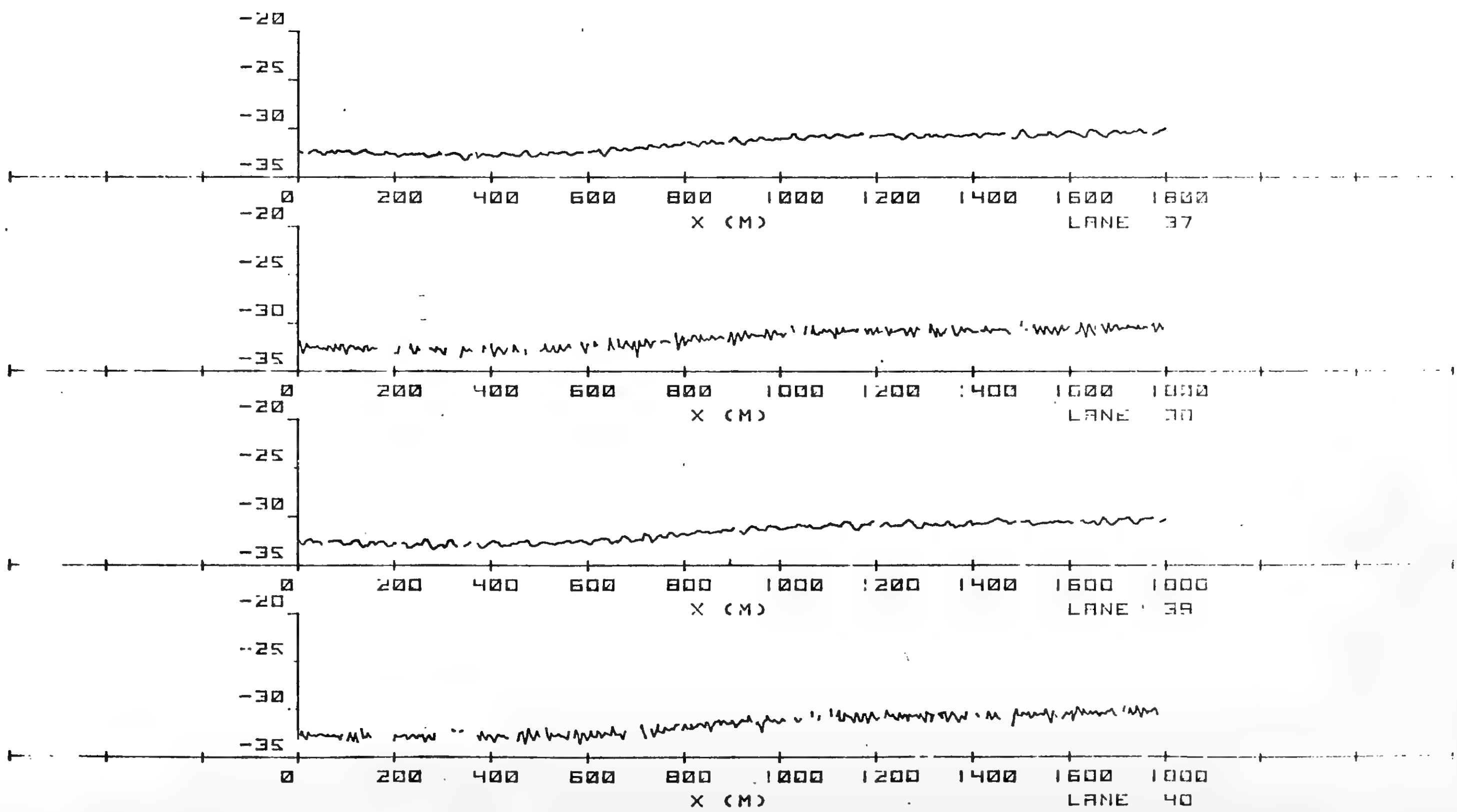


GRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M



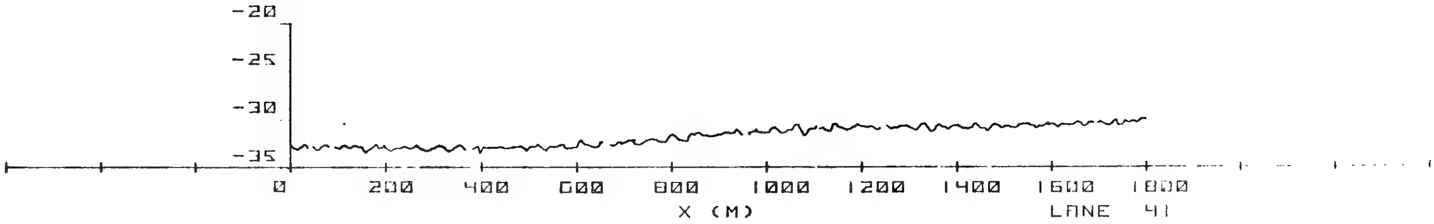
E-2

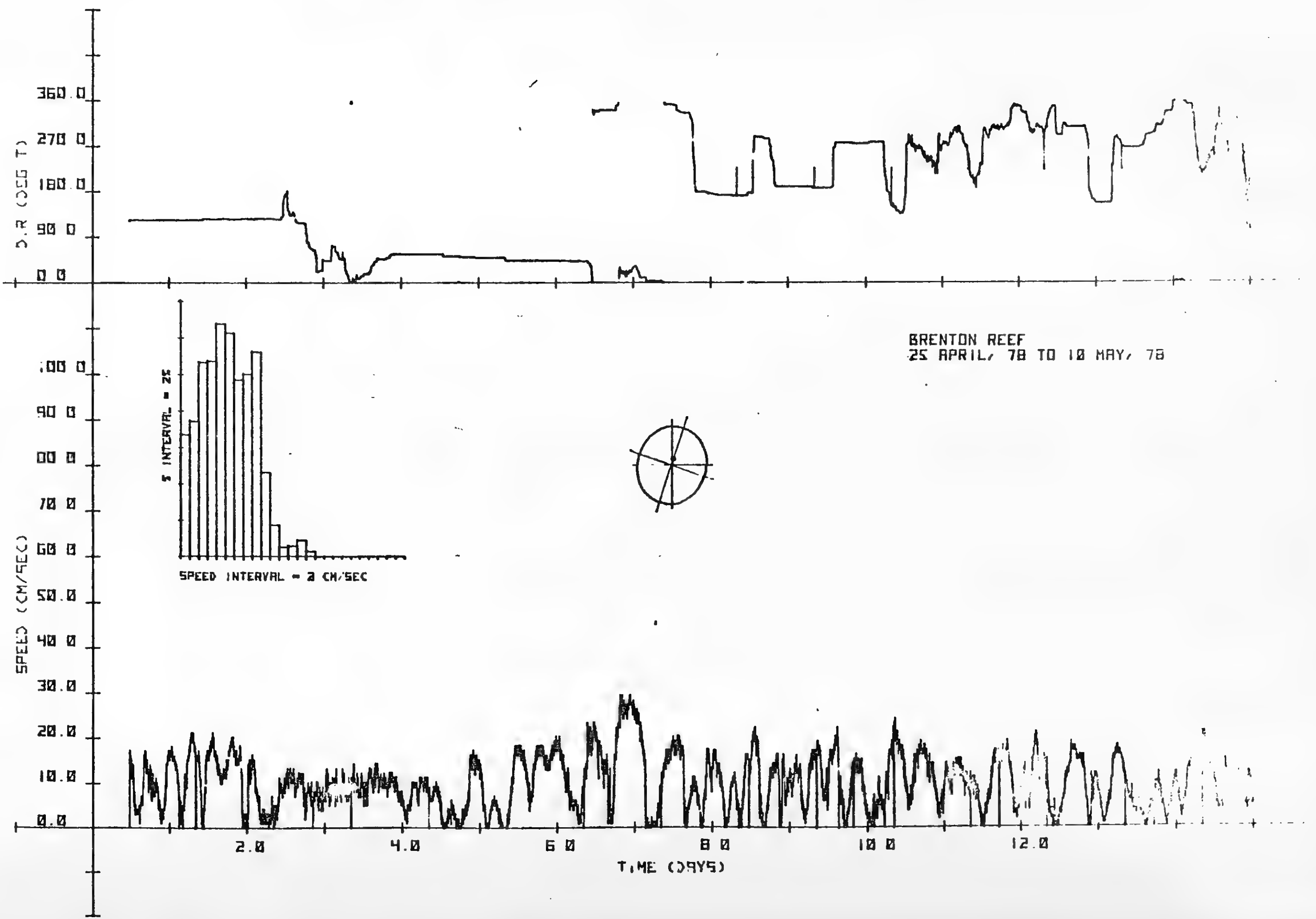
BRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M



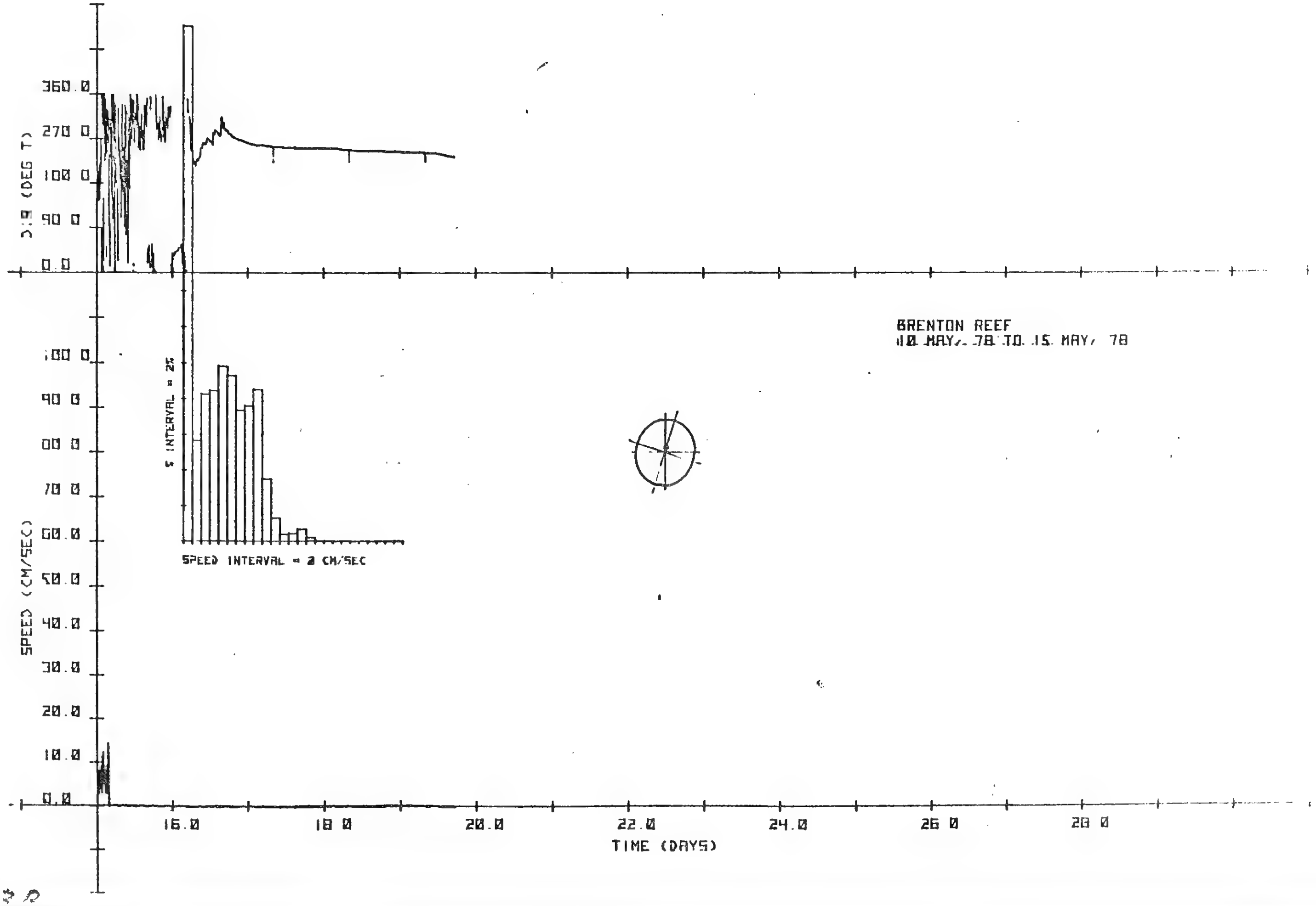
E 2 k

GRENTON REEF
4 AUG. 78
VERTICAL EXAGGERATION: 20X
LANE INTERVAL: -50M




BRENTON REEF
25 APRIL, 78 TO 10 MAY, 78
D.R (DEG T)
360.0
270.0
180.0
90.0
0.0
SPEED (CM/SEC)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
2.0
4.0
6.0
8.0
10.0
12.0
TIME (DAYS)

E 3n



BRENTON REEF
10 MAY, 78 TO 15 MAY, 78
360.0
270.0
180.0
90.0
0.0
(DEG T)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
SPEED (CM/SEC)
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
16.0
18.0
20.0
22.0
24.0
26.0
28.0
TIME (DAYS)

all measurements must be suspect. The speed data are summarized in Table E-1 for comparison with other sites. The horizontal kinetic energy of 50.95 dynes/sec and 10% highest speeds of 21.6 cm/sec are higher than both Portland and Boston Foul Ground indicating that even though the tether was fouled, the meter was responding to the current flow. These are suprisingly high values and might indicate that the sand material on the top of the spoil mound is subject to motion, particularly during periods of high wave action.

TABLE E-1

	Total OBS. Current	Tidal Current Inc. Mean	Residual Current	Mean Current
Semi-major axis (cm/sec)	7.5 *	-	-	-
Semi-minor axis (cm/sec)	6.7 *	-	-	-
Direction (°T)	018 *	N.A.	N.A.	-
Horizontal Kinetic energy (dynes/sec)	50.95 *	N.A.	N.A.	0.52 *
10% Highest speeds (cm/sec)	21.6 61.4%	-	-	-
Peak Speed (cm/sec)	-	N.A.	-	-
Average maximum speed (cm/sec)	-	N.A.	-	-

*Direction Not Working

Sediments

Heavy metal data from the Brenton Reef area are presented in Table E-2. The Brenton Reef samples are all relatively clean, although those taken from the disposal site have higher concentrations than the reference site. When the two sample sites are considered in relation to the whole region they have concentrations so low that they were used, along with Cornfield Shoals and New London, as the basis for deteriming background levels. With the sand layer as a cover over the spoils it is apparent that very little heavy metal enriched spoil material is available to the water column over much of the Brenton Reef site.

Benthic Biochemistry

Samples of *Mytilus edulis* for the Brenton Reef site were obtained from a reference location known as the Newport Outer Bridge on the south coast of Aquidneck Island approximately two miles north of the disposal area. Data from the reference and disposal sites presented in Table E-3 and Figure E-4 reveal three patterns of heavy metal-mussel interaction. The ratios of Cd and Hg, being within the prescribed 95% confidence limits, show the least change. A distinct increase of the concentraion of Fe is noted in the July 1978 sample obtained from Brenton Reef, while samples of the same period from Newport Outer Bridge and Brenton Reef show concomitant increases in the concentraion of Zn. The third pattern of heavy metal behaviour is characterized by a significant decrease in the concentration of Cu, Fe and Pb from the reference area. When one considers the July 1978 sample from the reference and disposal areas as a set, the concentration of Cu, Fe, Hg and Pb of the former is consistently lower than that of the latter.

TABLE E-2

SURFACE SEDIMENT ANALYSIS

BRENTON REEF R.I.

SAMPLING	Cd	Co	Cr	Cu	Fe*	Hg	Ni	Pb	Zn	Vol/Sol	Oil/Grease
			All metals ppm							(%)	(ppm x 10^3)
APRIL 1978											
BR Ref	.12	2.4	7.2	2.6	.61	.01	11	8.4	17	1.6	2.2
BR 1	.24	5.0	14	6.0	1.4	.01	29	7.2	31	4.1	nil
BR 2	.12	2.3	3.1	2.0	.46	nil	13	2.3	8.1	2.1	.48
AUGUST 1978											
BR Ref	.12	1.9	13	2.5	.54	nil	4.2	8.9	17	2.3	.34
BR	.12	3.9	24	11	.94	.03	8.7	13	36	8.3	.27

*All Fe values multiply by 10^4

TABLE E-2a

SAMPLE LOCATIONS

SITE: Brenton Reef

	DISPOSAL SITE:				REFERENCE SITE		
DATE	CURRENT METER	MUSSELS	BENTHIC SAMPLES DREDGES	BENTHIC SAMPLES GRABS	MUSSELS	BENTHIC SAMPLES DREDGES	BENTHIC SAMPLES GRABS
11/Dec/1978			$41^{o}23'22.4''$ $71^{o}18'25.2''$			$41^{o}21'47.7''$ $71^{o}19'39.9''$	
30/June/1978					Green Bridge		
3/Aug/1978			$41^{o}22'16.5''$ $71^{o}17'14.1''$				
19/Apr/1978	$41^{o}23'24.3''$ $71^{o}18'26.1''$	$41^{o}23'27.1''$ $71^{o}18'28.4''$					
25/Apr/1978							

Brenton Reef

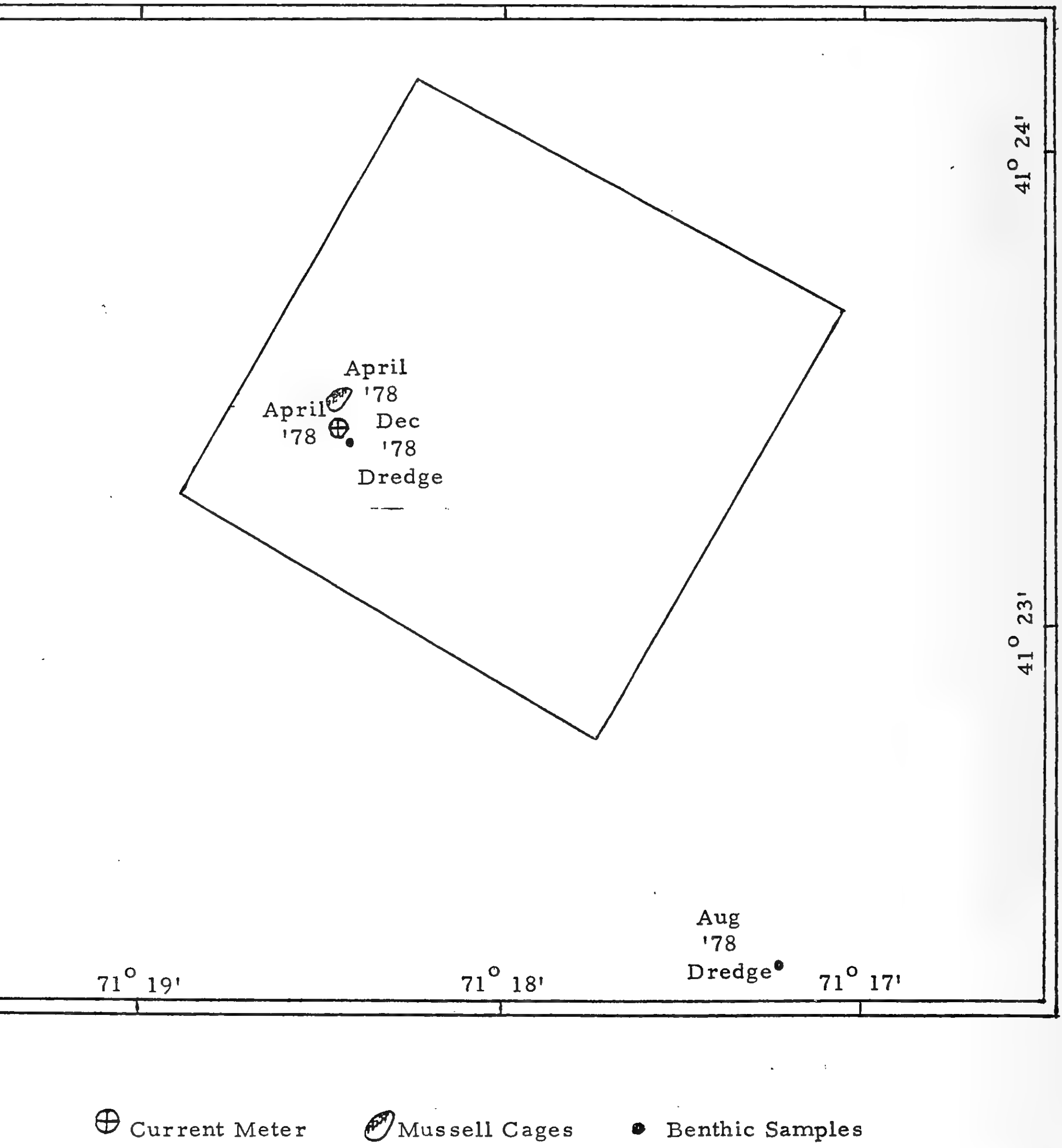


TABLE E-3 HEAVY METAL CONCENTRATIONS (PPM) IN *MYTILUS EDULIS* FROM NEWPORT OUTER BRIDGE DEPLOYED AT BRENTON REEF DISPOSAL SITE (SOUTHERN NEW ENGLAND).

DATE	LOCATION		CD	CR	CU	HG	PB	ZN	FE
5-11-78	NEWPORT OUTER	$\bar{x}$	3.68	3.21	9.11	0.213	3.59	69	333
	BRIDGE	S.D.	0.20	1.02	0.85	0.021	0.17	8	9
7-5-78		$\bar{x}$	3.16		6.13	0.180	1.75	117	277
		S.D.	0.66		0.18	0.021	0.38	8	52
7-5-78	BRENTON REEF	$\bar{x}$	3.31	5.75	8.91	0.245	2.80	104	503
		S.D.	0.15	3.80	1.19	0.015	0.37	2	83

Benthic Macrofauna

Numeric density data of the benthic population in the vicinity of the Brenton Reef Disposal site and a reference location at 41°21'47.7"N, 71°19'39.9"W, southwest of the disposal area are presented in Tables E-4 and E-5. These data indicate a population comprised of 83 species and 10473 individuals was present at these two sites. The high number of individuals is caused by an extremely dense population of the amphipod, *Ampilisca agassizi* at the reference station. Members of this species accounted for 8080 individuals or 77% of the total number of individuals collected at both sites.

There are many similarities between these stations and stations in the Gulf of Maine; namely high sample to sample variability, a clumped spatial distribution and a small percentage of the total number of species accounts for a large percentage of the total number of individuals (at the reference site). The values for diversity are somewhat lower than most of those calculated for the Gulf of Maine and indicate a somewhat less stable environment at the Brenton Reef sites. The presence of such large number of *Ampelisca agassizi*, a species considered sensitive to pollution, would argue that some degree of instability rather than pollution is the probable reason for a lower value of diversity. The mean value for specied evenness(s') is somewhat higher at the Brenton Reef dump site than for most of the more northern sites and is notably higher than that calculated for the Brenton Reef reference station.

Fisheries

The fisheries of the dump site were discussed in a 1972 report by Saila, Pratt and Polgar. The lobster fishery was examined in 1975 (Pratt, 1978). A

TABLE E-4

DAMOS BENTHOS - TABLE OF NUMERIC DENSITY DATA

STATION BRENTON REEF DUMP SITE DATE: 25 APRIL 1978

	PREDOMINANT SPECIES	DREDGE NUMBER #1	#2	#3	TOTAL	MEAN	STANDARD DEVIATION	COEFF. OF DISPERSION	95 PERCENT CONF. LIMITS OF MEAN	NUMERIC RANK	% OF TOTAL	CUMUL. % OF TOTAL
1.	Ninoe nigrippes	6	0	3	9	3.0	3.0	3.0	0-10.5	1	30.0	30.0
2.	Scalibregna inflatum	4	0	0	4	1.3	2.3	4.1	0- 7.0	2	13.3	43.3
3.	Unciola irrorata	2	0	2	4	1.3	1.2	1.0	0- 4.3	2	13.3	56.6
4.	Nucula proxima	0	0	2	2	0.7	1.2	1.9	0- 3.7	3	6.7	63.3
5.	Spisula solidissima	0	0	2	2	0.7	1.2	1.9	0- 3.7	3	667	70.0
6.	Cerianthus sp.	0	0	1	1	0.3	0.6	1.1	0- 1.8	4	3.3	73.3
7.	Rynchocoela sp.	1	0	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	76.6
8.	Ampharete arctica	0	1	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	79.9
9.	Lumbriclymene cylindricauda	0	0	1	1	0.3	0.6	1.1	0- 1.8	4	3.3	83.2
10.	Nephthys incisa	1	0	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	86.5
11.	Nephthys sp.	0	1	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	89.8
12.	Polycirrus sp.	1	0	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	93.1
13.	Byblis serrata	1	0	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	96.4
14.	Cancer irroratus	1	0	0	1	0.3	0.6	1.1	0- 1.8	4	3.3	99.7
	TOTAL	17	2	11	30	10.0	7.6	5.7	0-28.9			
	TOTAL NO. OF SPP PER DREDGE	9	2	6	15	5.7	3.5		0-14.4			
	SPECIES DIVERSITY (H')	1.91	0.69	1.72	4.32	1.44	0.66					
	EQUITABILITY (J')	0.87	1.00	0.96	2.83	0.94	0.07					

TOTAL NO. OF INDIVIDUALS THIS STATION = 30
(corrected for one Nematode)

TABLE E-5

DAMOS BENTHOS - TABLE OF NUMERIC DENSITY DATA

STATION BRENTON REEF REFERENCE STN — DATE 19 APRIL 1978

PREDOMINANT SPECIES	DREDGE NUMBER 1	2	3	TOTAL	MEAN	STD DEVIATION	CEOFF. OF DISPERSION	95 PERCENT CONF.LIMITS OF MEAN	NUMERIC RANK	% OF TOTAL	CUMU % OF TOTAL
1. Ampharete acutifrons	163	240	211	614	204.7	38.9	7.4	108.1-301.3	1	26.0	26.0
2. Chone infundibuliformis	74	122	157	353	117.7	41.7	14.8	14.1-221.3	2	14.9	40.9
3. Unciola irrorata	75	185	90	350	116.7	59.7	30.5	0-265.0	3	14.8	55.7
4. Leptocheirus pinguis	0	182	107	289	96.3	91.5	86.9	0-323.6	4	12.2	67.9
5. Ninoe nigrippes	46	65	63	174	58.0	10.4	1.9	32.2- 83.8	5	7.4	75.3
6. Eudorella emarginata	16	32	22	70	23.3	8.1	2.8	0- 28.2	6	3.0	78.3
7. Pherusa affinis	22	23	19	64	21.3	2.1	0.2	16.1- 26.5	7	2.7	81.0
8. Scalibregma inflatum	14	20	14	48	16.0	3.5	0.8	7.3- 24.7	8	2.0	83.0
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											
17.											
18.											
TOTAL	410	869	683	1962	654.0	230.9	81.5	71.4-1227.6			
TOTAL NO. OF SPP. PER DREDGE	40	48	49	77	45.7	4.9	0.5	33.5-57.9			
SPECIES DIVERSITY (H')	1.04	1.08	1.13	3.25	1.08	0.05					
EQUITABILITY (J')	0.28	0.28	0.29	0.85	0.85	0.28	0.01				

TOTAL NO. OF INDIVIDUALS THIS STN = 8080
(CORRECTED FOR AMPELISCA AGASSIZI)

chart of fisheries in the vicinity of the disposal site is presented in Figure E-5.

This report is based on interview data and mapping of lobster pot buoys during the summer of 1978. Log book data obtained from lobstermen fishing in the dump site will be used to quantify the effect of this dump site.

Floating Trap Fishery

Of all the resources which could be potentially affected by spoil disposal at the Brenton Reef site, the trap fishery is the most difficult to fully assess. The major trap fisheries in Rhode Island are located off Newport and Sakonnet within three to four miles of the disposal site. The major target species is scup. Scup catches were very large in 1964 and 1965 and declined steadily during the period that spoil was being deposited. It was suggested by fishing interests that suspended sediment from eroding spoil had caused the scup to change their migratory paths.

Sissenwine and Saila (1974) analyzed trends in the scup fishery and showed how the decline in scup catches had occured from Block Island to Virginia beginning between 1958 and 1963 in different areas. Scup fishing recovered in all areas in 1975 and 1976 making it clear that the decline in Rhode Island catches was part of a regional trend.

This problem is not completely resolved however, since erosion of the surface of the spoil pile has taken place and little is known about the effects of turbid water on the behavior of schools of fish in natural environments. Preliminary experiments by Marchesseault and Saila (1977) indicate that scup move away from areas of falling fine sand in test tanks. Wilson and Connor (1976) found that even visually acute fish such as mackeral would enter and feed in

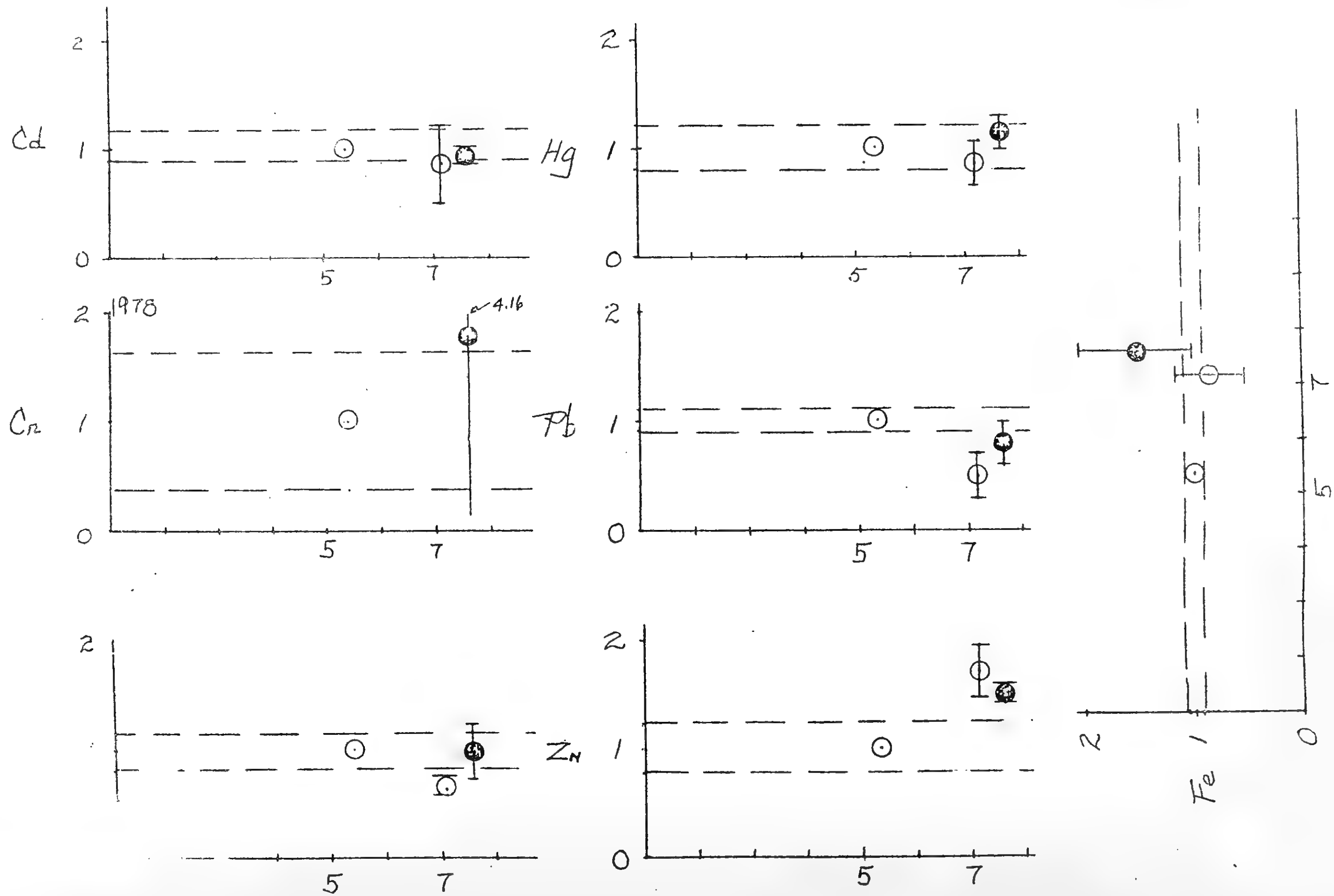
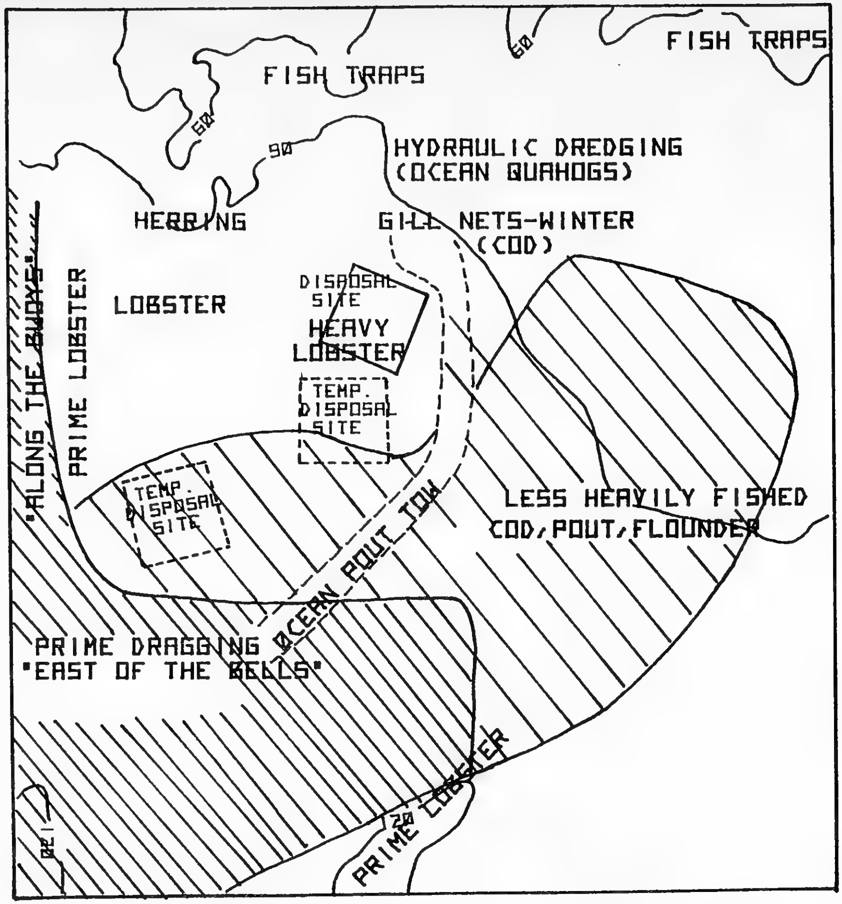


Figure E-4A Temporal variation in the ratios of heavy metals in *Mytilus edulis* from Newport Outer Bridge (O) deployed at Brenton Reef disposal site (●). Broken lines represent the 95% confidence limits of the baseline data.



FISHERIES IN THE VICINITY OF
BRENTON REEF DISPOSAL SITE

water which was opaque from china clay discharges, but that shoals of small herring were observed to avoid the edge of the "dense-white" water. There is no reason to think that scup are unusually sensitive to suspended sediment since they enter turbid estuaries and feed on the bottom.

Other Commercial Finfisheries

The pattern of fishing around the dump site has changed over the last eight years both because of the dumping activity and changes in gear use.

Previous to dumping, scup and butterfish were caught in the summer by small vessels from Newport. This fishery is no longer active because of obstruction both from the dump site and from large numbers of lobster pots in the area. In the past, large cod catches were made while they were feeding on ocean quahogs broken by dredges. Winter cod catches east of the dump site have varied in success from year to year but do not seem to be related to the presence of the site. The major bottom fishery in the immediate disposal site area is for ocean pout in the winter by vessels from Point Judith. A typical tow path would start several miles southwest of the disposal site and run northwest coming within a mile of the southern corner, then run north to the general area of the 30 meter contour. This course avoids spoil at the temporary sites southwest of the site and a wreck south of the site. As many as ten vessels participate in this fishery.

Midwater pair trawling for the blueback herring is carried out shoreward of the disposal site during the winter in years when the fish are abundant. Herring were not caught in 1978.

Tub trawling (fishing with long lines of baited hooks) has traditionally been used to catch cod along the thirty meter contour in the dump site area by lobster boats in the winter. Gill nets can be used by the same size boats and are much more productive. In 1978 gill netting was successfully carried out on, and adjacent to, the disposal area by fishermen from Sakonnet, RI.

Sport Fishing

There is no interaction between sport fisheries and spoil effects at the Brenton Reef dump site. The nearest sport fishing area is around the Brenton Reef Tower, a location which is considerably more turbid than near the dump site due to the closeness of Narragansett Bay and soft bottom at the mouth of the Bay.

In general sport fisheries have less chance of impact from spoil than commercial trawlers because a smooth bottom is not required. Bottom fish will be affected more than pelagic or surface fish. As an example of absence of effects, bluefish catches were good immediately adjacent to an active dredging and disposal operation at Conimicut Point, Narragansett Bay, In 1976.

Ocean Quahog Fishery

The impact on the ocean quahog fishery at the Brenton Reef dump site was severe and direct. A large population was buried and fishing had to be curtailed around the edges of the area because some clams were killed by shallow burial or had foul smelling mud on their shells. The greatest problem occured southwest of the site where highly polluted spoil from Providence Harbor was deposited at temporary sites.

In 1967 to 1970 there was no procedure for closure of the area to clamming. The Food and Drug Administration, Shellfish Sanitation Branch, now takes an active role in monitoring and determining potential closures in Rhode Island Sound, and would close an area no smaller than one mile in diameter if sediment from polluted areas was being dumped. In the past the processers of ocean quahogs have asked that fishermen avoid the disposal area.

Between 1970 and the present ocean quahog fishermen have converted from "rocking chair" dredges to hydraulic dredges. More fishing is now done in sandy sediments which yield a higher quality product. Recently fishing has been carried out north and northeast of the disposal site at depths of less than 30 meters.

Lobster Fishing

Lobster pot buoys were mapped in the area one-half to one mile around the dump site on July 15, August 4, and August 18, 1976 and on June 16, June 29, July 12, July 26, and August 17, 1978. Locations were approximated by compass bearings to the dump site buoys and distances from a hand-held range finder. On July 29 the DAMOS LORAN C navigation system was used. Depths were measured by depth sounder. Numbers were recorded from the buoys and the license holder identified. Six of the fourteen fishermen fishing the area have been interviewed. Two of these have been interviewed several times.

The density of buoys was greater in 1978 than in 1976, however, the pattern of fishing was similar. Fishing began in June with pots set on the edges of the spoil northwest (shoreward) and southwest sides and on the spoil mound. Pot density and placement was similar through July 26 but with fewer placed on the shallowest part of the mound. On August 17 the vessels which had been fishing the dump site had moved offshore and pots were placed around the site perimeter by other fishermen.

The following information summarizes interviews made in 1976 and 1978. All fishermen were full-time. Home ports were Point Judith, Newport, and Sakonnet, RI. Boat lenghts ranged from 34 to 45 feet. Pots fished in the disposal site area ranged from 10 to 200, frequently in a string of three 10-pot trawls.

Most fishing near the site took place from July through August. Most of the fishermen moved through this area following the offshore movement of recently shed lobsters, two went no further offshore than the disposal site at any time of the year.

Catches within the designated disposal area were described as good in small areas which could be fished out in a short time. The presence of resident lobsters (grounds keepers), or of migratory lobsters on favorable bottom was suggested. Catches in the area surrounding the disposal site were also good and could be fished longer.

The catch per pot appeared to be better than surrounding sand bottom and similar to soft-bottomed areas to the west. The condition of the lobsters was reported to be excellent with fewer injured lobsters than are caught near finfish dragging grounds "along the buoys" to the west. Some large catches of egg-bearing females were reported but in general the composition of catches was similar to adjoining areas.

Unusually large numbers of crabs have been caught on the west and south edges of the spoil. In one case the catch was large enough to fish for crabs alone despite the low price for which they were sold.

Only one fisherman was fishing in the area while dumping was being carried out. He found initial high catches immediately after dumping ceased, which decreased to a steady level after one and one-half to two years. Another fisherman reported low catches a year or two after dumping ceased, which then increased to a steady level.

In the first year after dumping ended small pots would sink into the spoil so that lobsters could not enter. One fisherman had his gear caught on a very heavy conducting cable but did not lose any pots.

All fishermen believed that there was no possibility of contamination of lobsters in the disposal area, and that this was not a consideration in the decision to fish there.

The original imputus for fishing near the disposal site was the denial of the area to draggers which formerly used the area. If the lobstermen using this area have any complaints concerning spoil disposal, it is the loss of fishing grounds by friends who operate small draggers.

In conclusion, it can be stated that the men presently fishing the spoil site find it as good or better than areas of natural bottom, and that denial of the area to draggers has increased their fishable grounds. Lobstermen who have had negative experiences in the area or avoid it for fear of some form of contamination have not been identified.