Summary Cruise Report

Southwest Florida Shelf Ecosystems Study - Year 2

CRUISE II - HYDROGRAPHY AND PRIMARY PRODUCTIVITY

Prepared for

THE MINERALS MANAGEMENT SERVICE under
CONTRACT NO. AA851-CT1-45

October 1982

Woodward-Clyde Consultants

Skidaway Institute of Oceanography

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1.0 INTRODUCTION

The primary goals of the Minerals Management Service's (MMS) Outer Continental Shelf (OCS) Environmental Studies Program are to obtain environmental data on the impacts of

1) natural resource exploration and development activities on the outer continental shelf and
2) to provide relevant information to decision makers in the Service's OCS minerals management program.

The MMS is considering the offer of certain lease tracts on the southwest Florida shelf in the eastern Gulf of Mexico (Proposed Sale 79). At the present time, the hydrographic distributions and productivity characteristics of the shelf waters in this area are still not well understood.

Pursuant to these goals, the MMS has determined that a study should be conducted to describe the ecology of the southwest Florida shelf with emphasis on delineating the primary productivity mechanisms of the outer continental shelf and their relationship to the dominant hydrographic distributions present during different seasonal periods. This report documents the field activities associated with the second cruise of the third phase of this program. Earlier cruises, during the first two phases, collected data pertaining mainly to benthic distributions and geophysical characteristics.

The specific goals of this cruise were:

1) To collect <u>in-situ</u> data pertaining to the hydrographic and primary productivity characteristics of the euphotic zone in the middle and outer continental shelf regions.

2) To develop a description of Loop Current intrusions under seasonal conditions different than those found during the previous April, 1982 cruise.

3) To augment the knowledge gained from the shelf (20 to 200-m) distributions developed during Years I and II of this study by investigation of shelf break processes and Loop Current interactions with resident shelf water.

2.0 CHIEF SCIENTIST'S REPORT

2.1 Cruise II Plan

On 10 September 1982, a pre-cruise meeting was held at the Florida Institute for Oceanography in St. Petersburg, Florida to finalize cruise plans. A tentative cruise plan was submitted to the MMS on 7 May; final pre-cruise revisions were submitted on 5 August 1982. All cruise personnel and Dr. J. Yoder were present at the meeting. The sampling objective of the cruise was to measure the effects of a subsurface Loop Current intrusion onto the shelf either by a time-series of transects across a single line on the shelf or by a survey along separated shelf transects.

Figure 2.1 illustrates the basic study area covered during the cruise. This area is basically the same longitudinal (83° to 85°W) region studied during the first (April) cruise but with a minor (approximately a half degree) shift of the latitudinal extent to the south.

2.2 Sampling Strategy

The sampling hypothesis is based on empirical evidence that during late spring and summer months, when shelf waters are stratified, intrusions of subsurface cold water are found even in the shallower regions of the shelf. The origin of the colder waters is generally associated with upwelled cores of relatively cold water brought on shore by intrusions of boundary currents such as the Gulf Stream System or Loop Current.

Because of the lack of thermal contrast on the sea surface, infrared imagery is generally not very useful during this season. To determine whether there was an intrusion of cooler water, an XBT transect along the 70 m isobath was occupied. The results of this transect were examined for areas of cooler bottom temperatures. No anomalously cooler temperatures were found so the first transect of the survey was occupied. This transect employed CTD and XBT sampling and covered the shelf from the 60 m to 2000 m isobaths. At the end of this transect, it was noted that relatively cold water was present on the shelf and that the Loop Current was not at its expected location next to the shelf. A set of stations 30 km to the north showed that the Loop Current was in the expected position at that point. Based on these preliminary examinations of the bottom temperatures and relative Loop Current positions, the Chief Scientist decided to return to the initial section and run a time-series of transects. Thus, the next three transects occupied the same section line as the first and employed CTD, XBT and sea water sampling. The time-series was interrupted from 1900 on 15 September to 0400 on 17 September for repairs to ship and scientific gear in Fort Myers.

The coverage of the study area is summarized as:

1) An XBT transect (A) along the 70 m isobath (Figure 2.2)
2) An XBT-CTD transect (B) along the shelf near 25°30'N (Figure 2.3)
3) A 30 km XBT-CTD transect (C) north to 26°N (Figure 2.4)
4) An XBT-CTD transect (F) across the shelf near 25°30'N (Figure 2.7)
5) Reoccupation of the above transect (Figure 2.8)
6) Reoccupation of the above transect (Figure 2.9)

Details are presented in the Chief Scientist's log in Appendix A.

2.3 Schedule and Participants

The Florida Institute for Oceanography's R/V SUNCOASTER departed St. Petersburg, Florida initially at 0200h on 12 September 1982. Final return to St. Petersburg occurred at 0700h on 19 September 1982. A number of problems were encountered both with the ship and onboard scientific sampling equipment. These problems are discussed in Section 2.5.

Cruise participants, their position and affiliation are listed in Table 2.1. Dr. J. Yoder (Skidaway Institute of Oceanography) planned and directed cruise activities through radio communication.

2.4 Data Collected

Station position information are presented in Table 2.2. A tabular division of the stations sampled along each section is presented in Table 2.3. Hydrographic measurements are summarized by section in Appendix C-1. Primary productivity and phytoplankton cell count samples are summarized in Appendix C-2. Measurements of surface temperature and chlorophyll fluorescence were taken every five nautical miles along all transects.

2.5 Problems

The Florida Institute for Oceanography's R/V SUNCOASTER departed St. Petersburg at 0200h on 12 September 1982 but had to return to St. Petersburg at 0945h on 12 September 1982 for ship repairs. The SUNCOASTER departed again at 1510h, 12 September for the beginning of the alongshore XBT section. Scientific sampling commenced at 0140h, 13 September and continued until 1918h, on 15 September. During this period, problems with the ship's radio, electrical system and the CTD winch developed. To expedite sampling, the Chief Scientist decided to go to Fort Myers for repairs to the CTD winch. Sampling commenced again at 0446h on 17 September and continued until 1803h on 18 September. The ship reached St. Petersburg at 0700h on 19 September.

Specific problems with ship's equipment and scientific sampling gear were as follows:

1) The R/V SUNCOASTER experienced mechanical problems that necessitated an initial outward bound leg return to port and several hours of repair time. Return to port: 0500h, 12 September. Depart port: 1510h, 12 September.

2) There were not enough independent electrical circuits to handle the power requirements of the scientific gear. During the course

of operation, the circuit breakers tripped, causing a loss of power and, in several instances, a loss of data. The crew did their best to rectify this situation and are to be commended for both their diligence and helpfulness.

3) The CTD winch malfunctioned at 1935h, 13 September. During repairs to the winch, sampling was continued using bottle casts to determine salinity, nutrients, chlorophyll and oxygen at discrete depths. XBT casts were used to define vertical temperature structure.

   At 0720h on 14 September the CTD was operational; however, the rosette was still non-functional. Bottle casts were used to obtain samples at discrete depths. At 1230h, 15 September, it became increasingly obvious that the connection to the SUNCOASTER winch was malfunctioning and would probably fail completely in the near future.

4) The crew was unable to maintain radio contact between 12 and 16 September due to radio malfunctions and believed that repairs were desirable.

It was therefore decided to go to Fort Myers for radio and winch repairs. All repairs were successful and no additional problems were encountered during the remainder of the cruise.

Table 2.1 CRUISE II PARTICIPANTS

Personnel	Position	Affiliation
Scientific		
S. Stephen Bishop	Chief Scientist	The Skidaway Institute
Joseph Saint	Field Operations Supervisor	Woodward-Clyde Consultants
Theresa Paluszkiewicz	Hydrography	The Skidaway Institute
Frank Flynn	Hydrography	The Skidaway Institute
Bill Chandler	Hydrography	The Skidaway Institute
Rachel Jankowitz	Hydrography	The Skidaway Institute
Kurt Emmanuelle	Productivity	The Skidaway Institute
Don Marr	Productivity	The Skidaway Institute
Guy Foulkes	Productivity	The Skidaway Institute

Table 2.2 STATION POSITION DATA

STATION SUMMARY FOR SUNCOASTER

CRUISE	STATION	LATITUDE	LONGITUDE	YR	MN	DY	HOUR GMT	DEPTH M	CONSEC NUMBER
001	001X	26 52.9N	83 46.9W	82	09	13	5.7	68	1
001	002X	26 44.0N	83 44.0W	82	09	13	7.0	72	2
001	003X	26 37.0N	83 41.0W	82	09	13	8.0	68	3
001	004X	26 28.0N	83 38.9W	82	09	13	9.2	68	4
001	005X	26 22.1N	83 35.0W	82	09	13	10.1	63	5
001	006X	26 13.1N	83 32.0W	82	09	13	11.3	63	6
001	007X	26 05.0N	83 30.0W	82	09	13	12.3	62	7
001	008X	25 57.1N	83 26.0W	82	09	13	13.4	63	8
001	009X	25 48.0N	83 24.0W	82	09	13	14.5	62	9
001	010B	25 50.0N	83 09.8W	82	09	13	17.0	54	10
001	011X	25 48.8N	83 15.4W	82	09	13	19.8	57	11
001	012C	25 47.1N	83 20.0W	82	09	13	20.7	60	12
001	013X	25 46.0N	83 26.0W	82	09	13	21.4	65	13
001	014C	25 45.0N	83 32.2W	82	09	13	22.0	70	14
001	015XB	25 42.2N	83 41.9W	82	09	14	0.8	88	15
001	016X	25 42.1N	83 47.7W	82	09	14	1.8	105	16
001	017XB	25 40.0N	83 52.0W	82	09	14	2.4	115	17
001	018X	25 38.5N	83 57.5W	82	09	14	3.5	132	18
001	019XB	25 37.0N	84 03.1W	82	09	14	4.1	140	19
001	020X	25 35.9N	84 08.2W	82	09	14	5.3	150	20
001	021XB	25 33.3N	84 14.1W	82	09	14	5.9	162	21
001	022X	25 31.9N	84 19.6W	82	09	14	7.1	162	22
001	023XB	25 29.3N	84 24.5W	82	09	14	7.7	217	23
001	024X	25 28.4N	84 30.4W	82	09	14	8.8	437	24
001	025XB	25 27.2N	84 34.4W	82	09	14	9.3	1260	25
001	026X	25 24.8N	84 41.4W	82	09	14	10.9	1830	26
001	027C	25 24.9N	84 45.1W	82	09	14	11.3	1980	27
001	028X	25 31.8N	84 47.5W	82	09	14	13.8	2290	28
001	029X	25 39.4N	84 49.7W	82	09	14	14.9	1740	29
001	030C	25 47.6N	84 52.8W	82	09	14	16.3	1740	30
001	031C	25 50.1N	84 48.1W	82	09	14	19.1	1170	31
001	032X	25 47.8N	84 53.2W	82	09	14	20.1	1740	32
001	033C	25 46.0N	84 57.9W	82	09	14	20.7	3300	33
001	034C	25 38.6N	84 58.3W	82	09	14	22.0	3340	34
001	035C	25 29.7N	84 55.0W	82	09	14	23.4	3300	35
001	036CB	25 20.5N	84 53.1W	82	09	15	0.5	3350	36
001	037X	25 21.0N	84 48.8W	82	09	15	2.5	3340	37
001	038CB	25 24.1N	84 45.0W	82	09	15	3.3	1980	38
001	039X	25 23.4N	84 40.0W	82	09	15	5.2	1530	39
001	040CB	25 25.2N	84 33.5W	82	09	15	6.2	915	40
001	041X	25 26.7N	84 30.2W	82	09	15	8.1	440	41
001	042CB	25 28.7N	84 25.1W	82	09	15	8.7	220	42
001	043X	25 30.8N	84 18.9W	82	09	15	10.6	163	43
001	044CB	25 33.3N	84 14.1W	82	09	15	11.4	163	44
001	045X	25 35.2N	84 08.6W	82	09	15	13.2	152	45
001	046CB	25 36.2N	84 03.3W	82	09	15	13.7	142	46
001	047X	25 38.5N	83 57.3W	82	09	15	15.5	131	47
001	048CB	25 40.0N	83 52.0W	82	09	15	16.5	120	48
001	049X	25 41.4N	83 47.5W	82	09	15	18.0	105	49
001	050X	25 42.2N	83 41.8W	82	09	15	18.7	88	50
001	051X	25 43.7N	83 36.8W	82	09	15	19.4	77	51
001	052X	25 44.8N	83 31.8W	82	09	15	20.0	70	52
001	053X	25 50.3N	83 24.9W	82	09	15	21.3	67	53
001	054X	25 47.2N	83 20.3W	82	09	15	22.0	64	54
001	055X	25 48.1N	83 15.1W	82	09	15	22.6	58	55
001	056X	25 50.0N	83 10.2W	82	09	15	23.2	54	56
001	057C	25 50.1N	83 10.4W	82	09	17	8.7	55	57
001	058X	25 49.3N	83 15.0W	82	09	17	9.7	58	58
001	059C	25 47.1N	83 20.0W	82	09	17	10.2	61	59
001	060X	25 46.3N	83 26.2W	82	09	17	11.2	65	60
001	061C	25 45.0N	83 32.2W	82	09	17	11.9	71	61
001	062X	25 43.6N	83 37.3W	82	09	17	12.8	75	62
001	063C	25 42.2N	83 41.9W	82	09	17	13.3	91	63

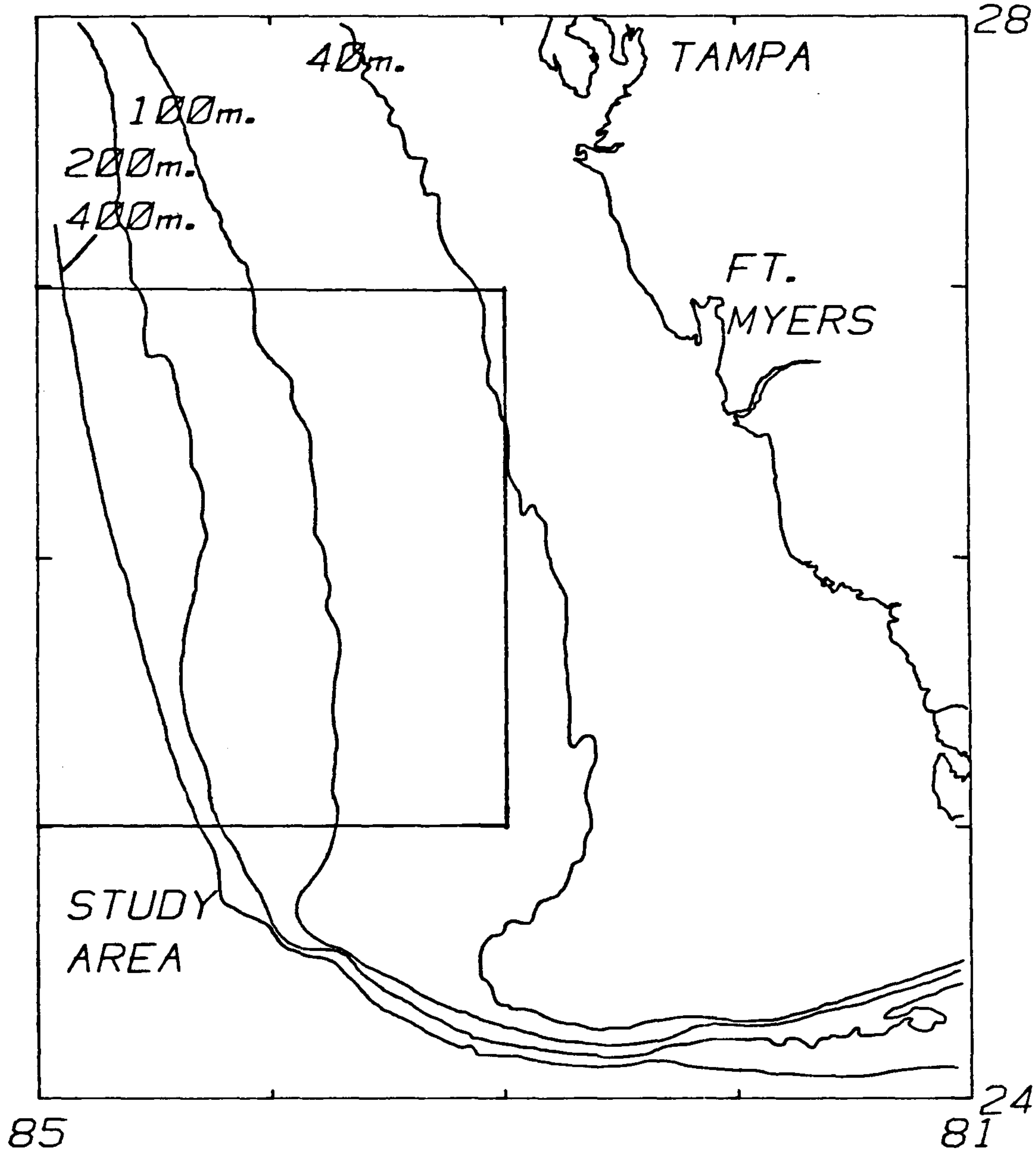
STATION SUMMARY [CONTINUED]

CRUISE	STATION	LATITUDE	LONGITUDE	YR	MN	DY	HOUR GMT	DEPTH M	CONSEC NUMBER
001	064X	25 40.8N	83 47.0W	82	09	17	14.2	102	64
001	065C	25 39.9N	83 52.0W	82	09	17	14.7	117	65
001	066X	25 38.5N	83 57.4W	82	09	17	16.5	135	66
001	067C	25 36.6N	84 03.6W	82	09	17	17.0	145	67
001	068X	25 35.2N	84 08.2W	82	09	17	18.6	153	68
001	069C	25 33.0N	84 14.7W	82	09	17	19.1	162	69
001	070X	25 30.8N	84 18.9W	82	09	17	20.3	159	70
001	071C	25 29.3N	84 25.1W	82	09	17	21.6	203	71
001	072X	25 27.9N	84 30.1W	82	09	17	22.2	484	72
001	073C	25 27.2N	84 34.4W	82	09	17	22.7	1260	73
001	074C	25 24.4N	84 40.2W	82	09	17	24.0	1830	74
001	075C	25 25.0N	84 46.0W	82	09	18	2.1	1980	75
001	076C	25 32.0N	84 48.0W	82	09	18	3.6	2290	76
001	077C	25 22.5N	84 44.3W	82	09	18	5.9	1980	77
001	078X	25 23.8N	84 40.0W	82	09	18	6.9	1830	78
001	079C	25 25.5N	84 33.5W	82	09	18	8.3	1260	79
001	080X	25 26.7N	84 30.2W	82	09	18	8.9	445	80
001	081C	25 28.1N	84 24.6W	82	09	18	9.2	204	81
001	082X	25 30.5N	84 18.9W	82	09	18	10.8	159	82
001	083C	25 33.0N	84 13.9W	82	09	18	11.5	163	83
001	084X	25 34.4N	84 08.1W	82	09	18	12.8	149	84
001	085C	25 37.0N	84 03.0W	82	09	18	13.5	143	85
001	086X	25 38.5N	83 57.3W	82	09	18	14.4	130	86
001	087C	25 40.0N	83 51.9W	82	09	18	15.2	117	87
001	088X	25 41.1N	83 47.6W	82	09	18	16.3	99	88
001	089C	25 42.1N	83 42.0W	82	09	18	16.9	90	89
001	090X	25 43.4N	83 36.7W	82	09	18	18.1	73	90
001	091C	25 45.0N	83 32.1W	82	09	18	19.0	71	91
001	092X	25 46.2N	83 26.2W	82	09	18	19.7	63	92
001	093C	25 47.0N	83 20.2W	82	09	18	20.4	61	93
001	094X	25 48.8N	83 15.1W	82	09	18	21.2	57	94
001	095C	25 50.0N	83 10.0W	82	09	18	21.8	55	95

Table 2.3 STATIONS ASSIGNED TO TRANSECTS

TRANSECT	STATIONS	DISTANCE OFFSHORE	DATE(Sept. 82)	TYPE
A	1X-9X	110(km)	13	XBT
B	10B-27C	137	13-14	BOT-CTD-XBT(BOT)
C	30C-27C	110	14	CTD-XBT
D	31C,30C,33C	333	14	CTD
E	33C-36C	352	14	CTD
F	56C-36C	137	14-15	CTD(BOT)-XBT
G	57C-75C	137	17	CTD-XBT
H	77C-95C	137	18	CTD-XBT

XBT = expendable bathythermograph
CTD = conductivity-temperature-depth cast; usually includes water sampling at discrete depths for nutrients, chlorophylls, oxygens, and calibration salinities
BOT = bottle casts; used to obtain water samples at discrete depths when the CTD and CTD rosette were non-functional.



Woodward-Clyde Consultants

Figure 2.1
Study Area During September 1982 Southwest Florida Outer Continental Shelf Data Collection Cruise

Proj 60834A	Date 10/20/82	Draft TMD	Appr

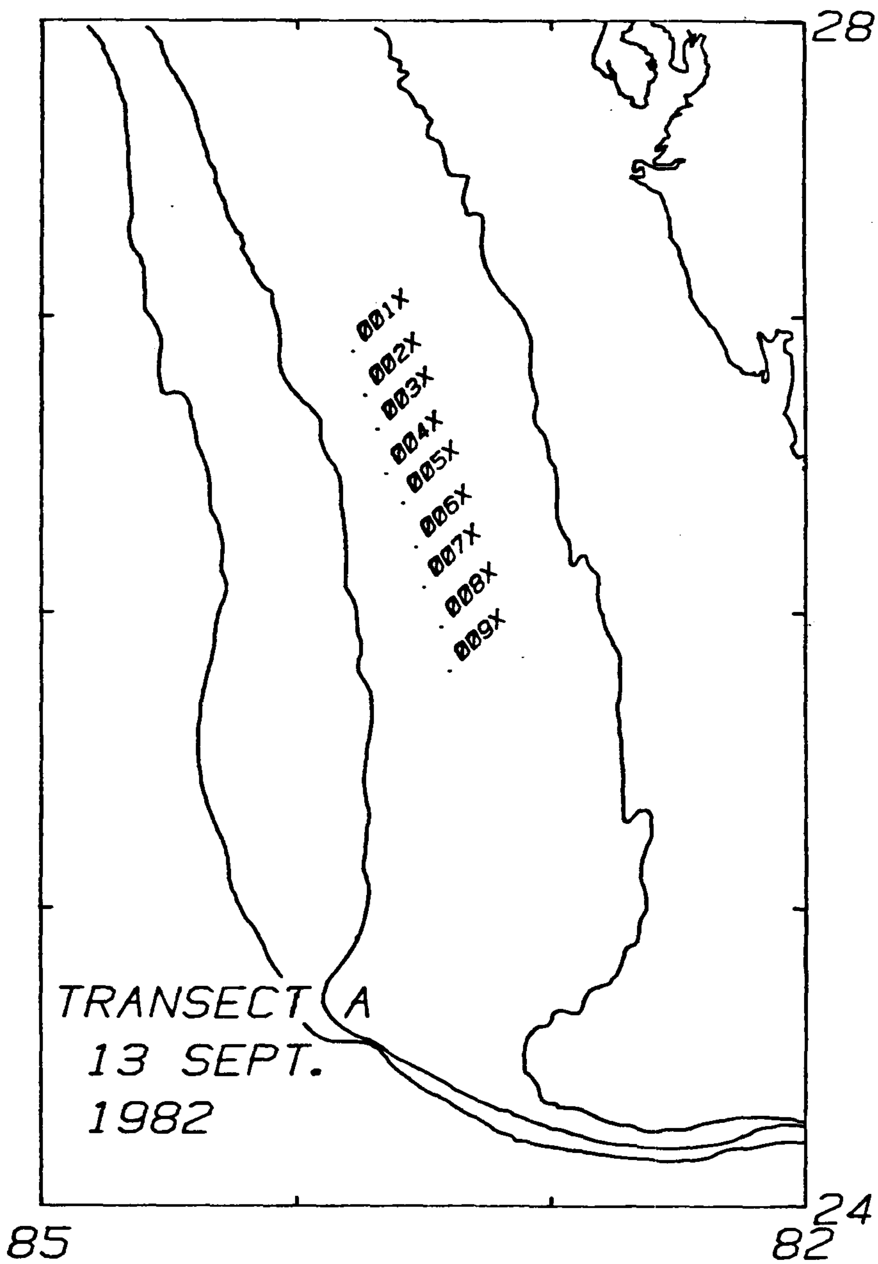


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Figure 2.2
Transect A Locations of XBT(X) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr HC

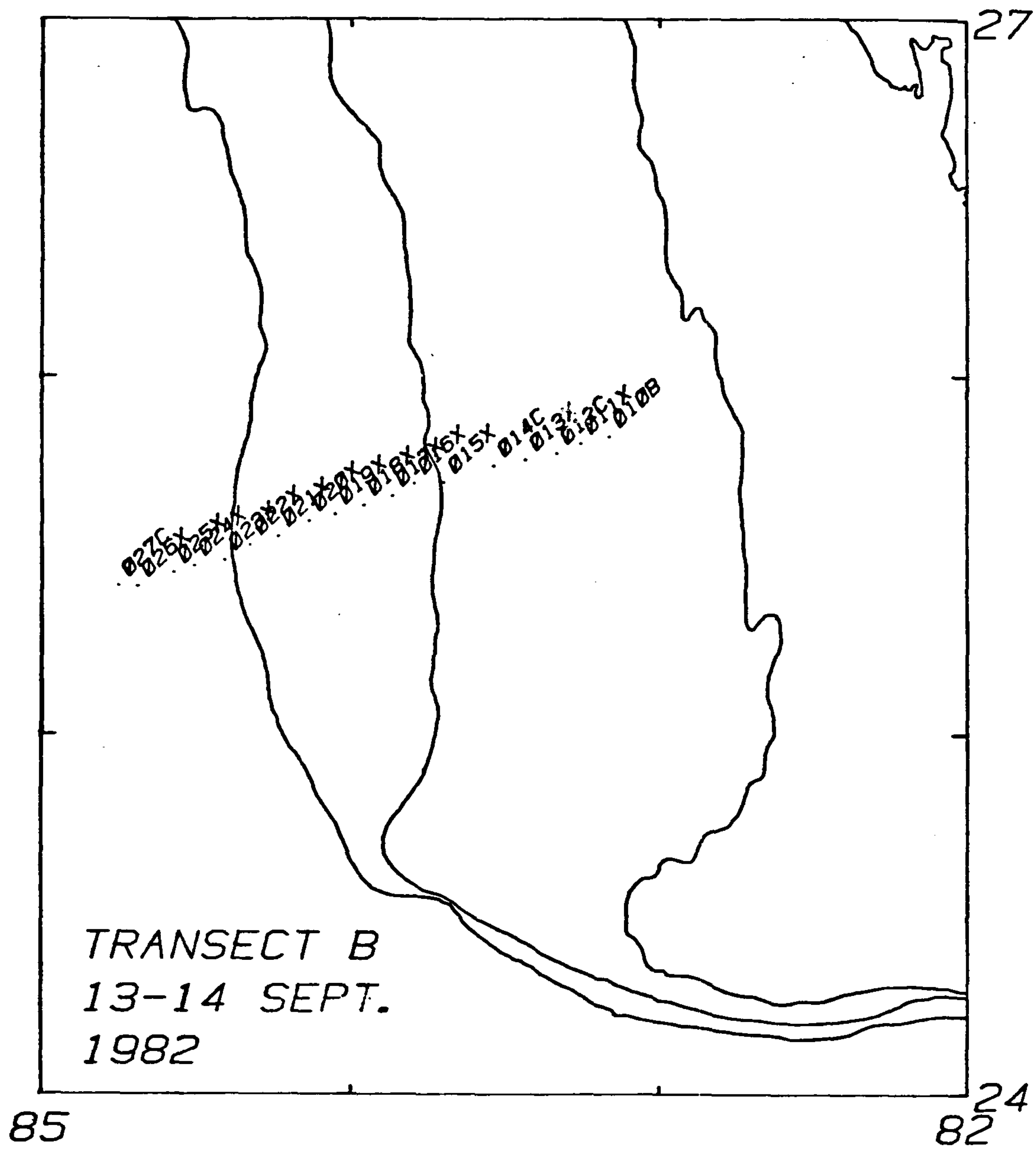

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Figure 2.3
Transect B Locations of XBT(X) and
CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr

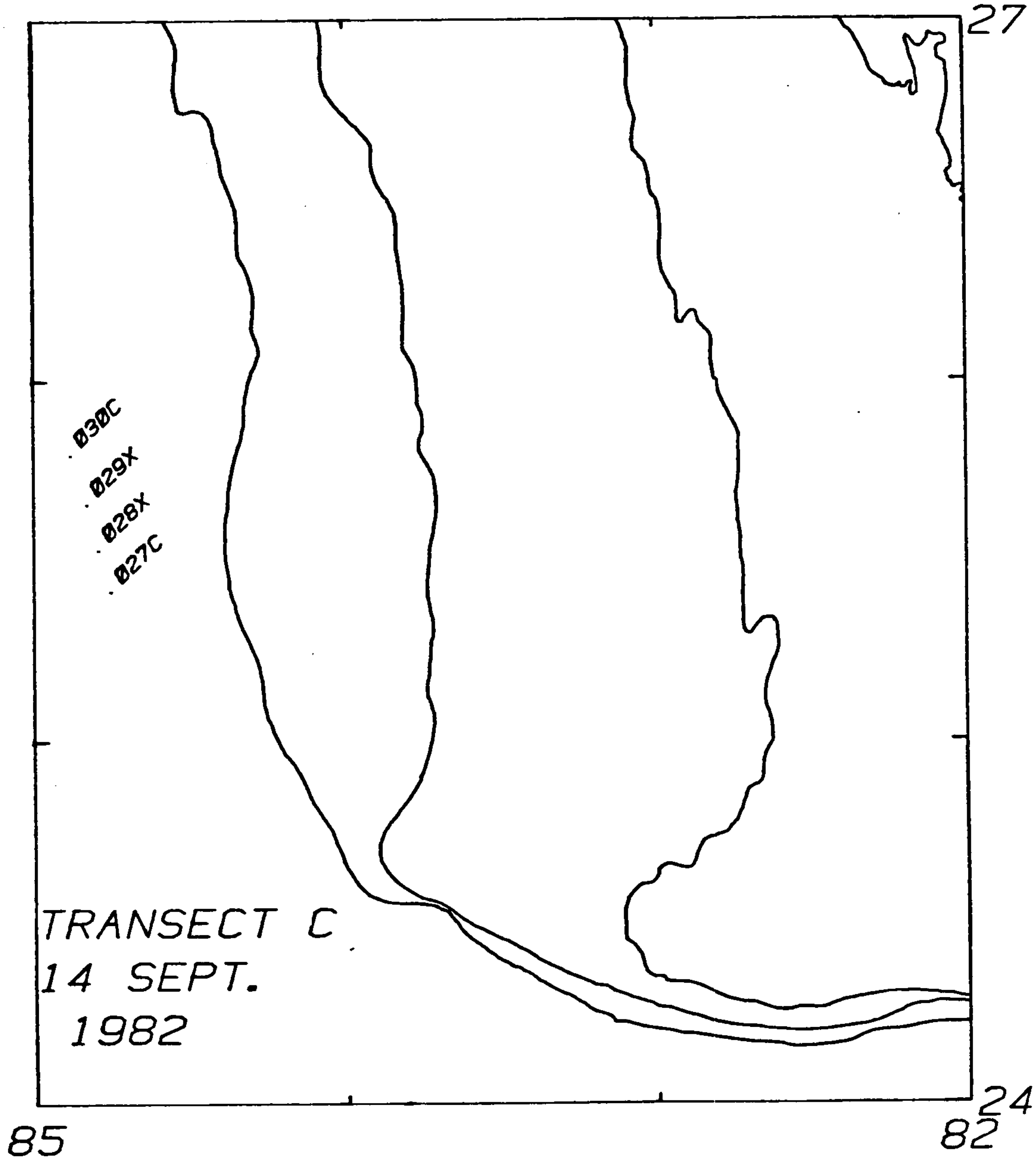

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Figure 2.4
Transect C Locations of XBT(X) and CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr HC

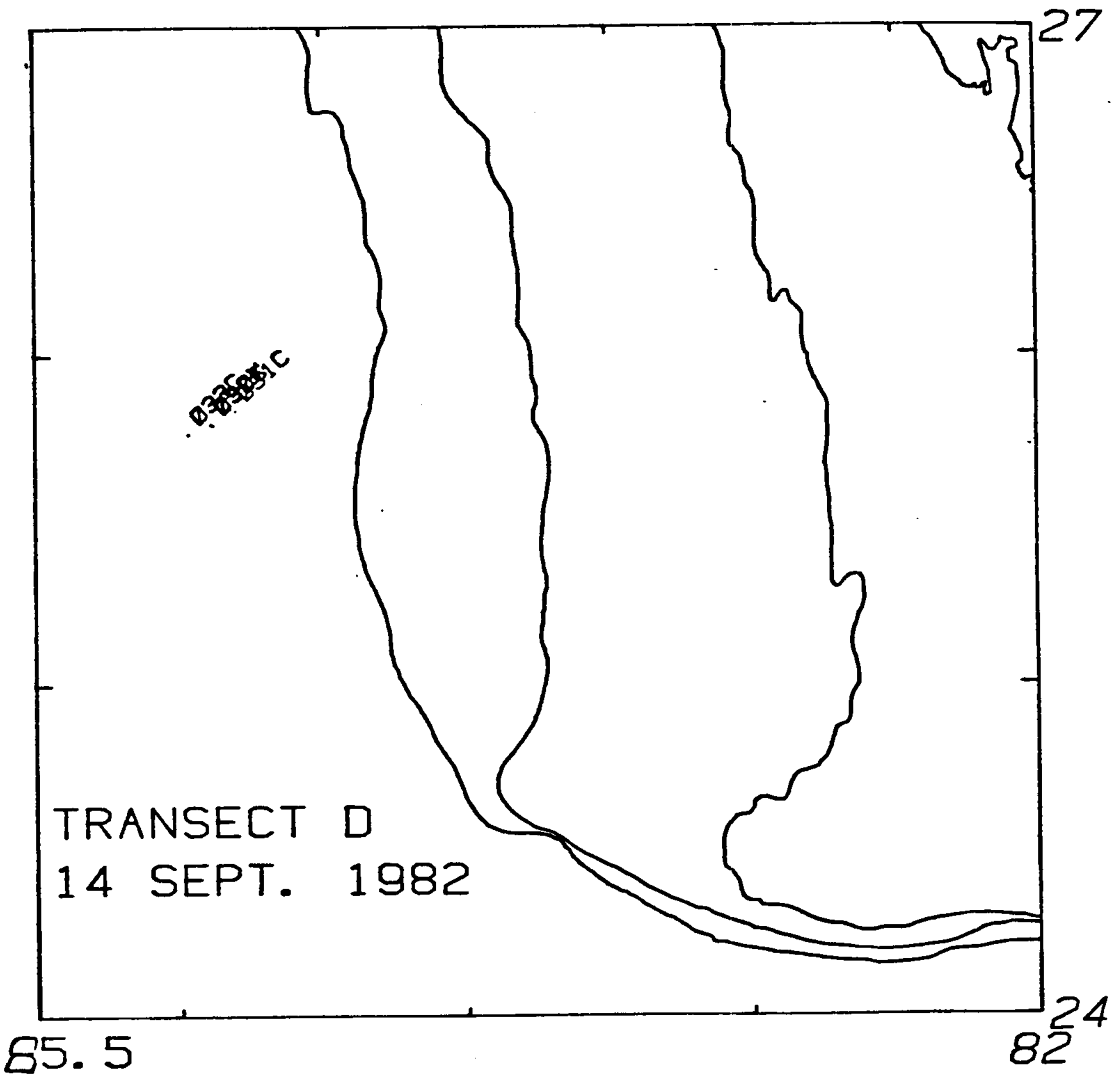

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Figure 2.5
Transect D Locations of XBT(X) and
CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr

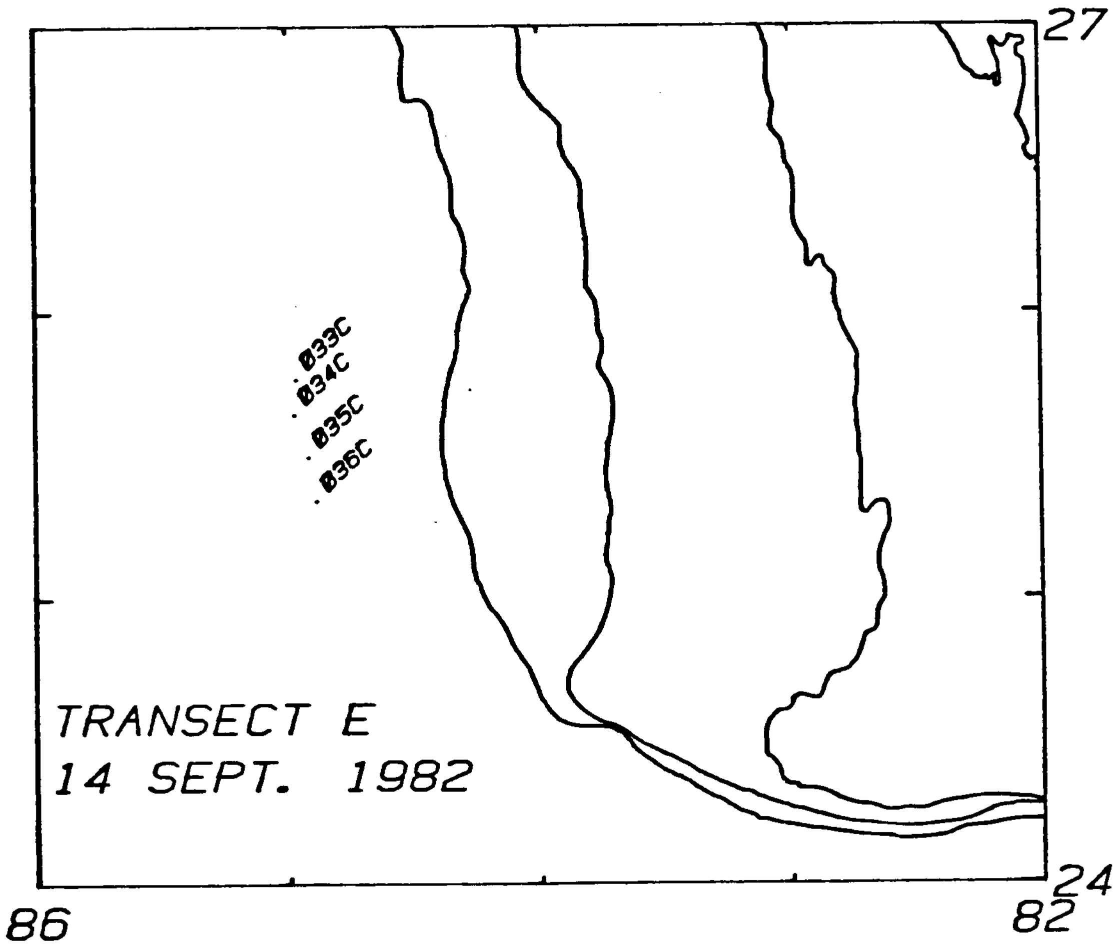

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Figure 2.6
Transect E Locations of CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr

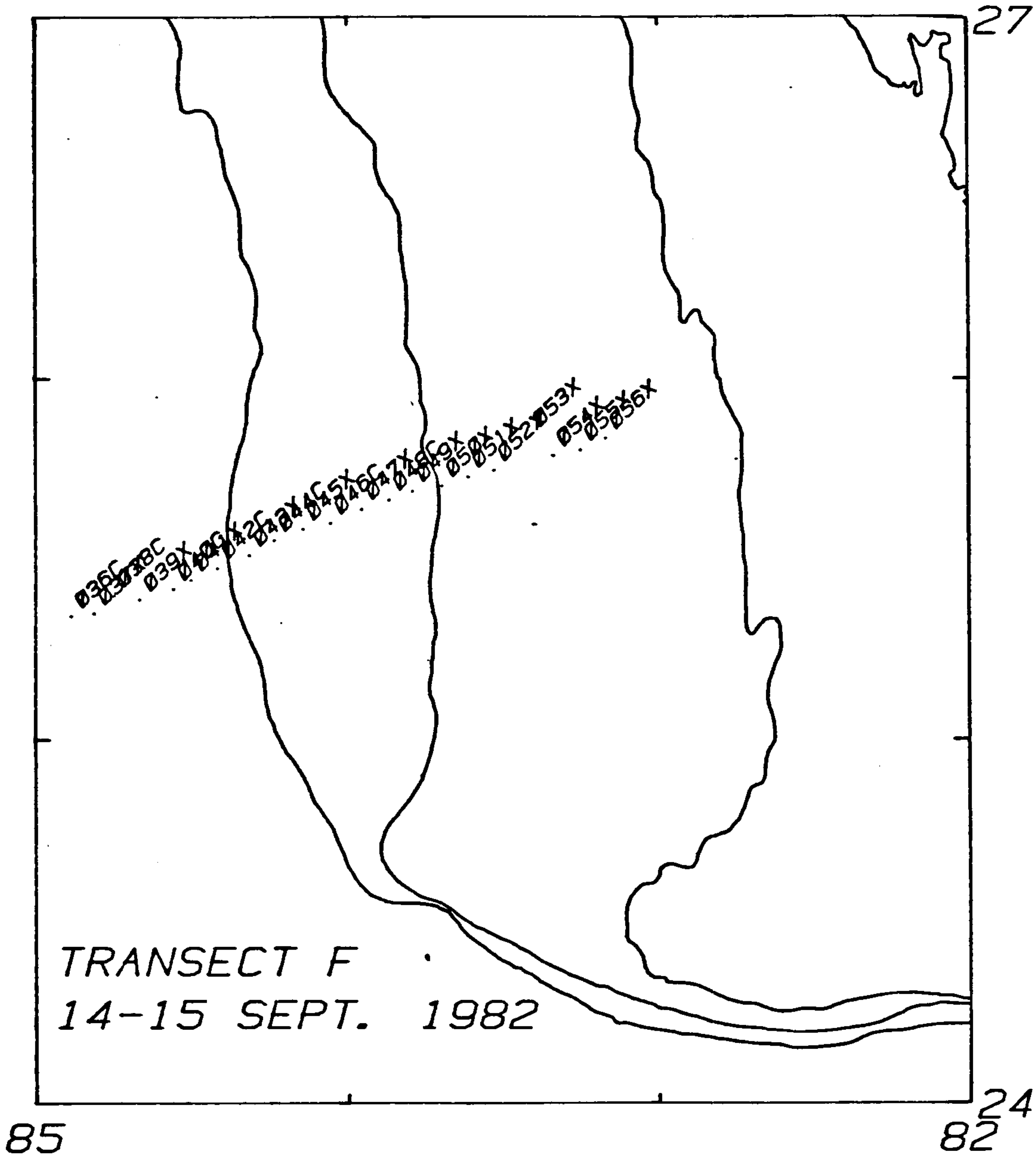

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Figure 2.7
Transect F Locations of XBT(X) and
CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr HC

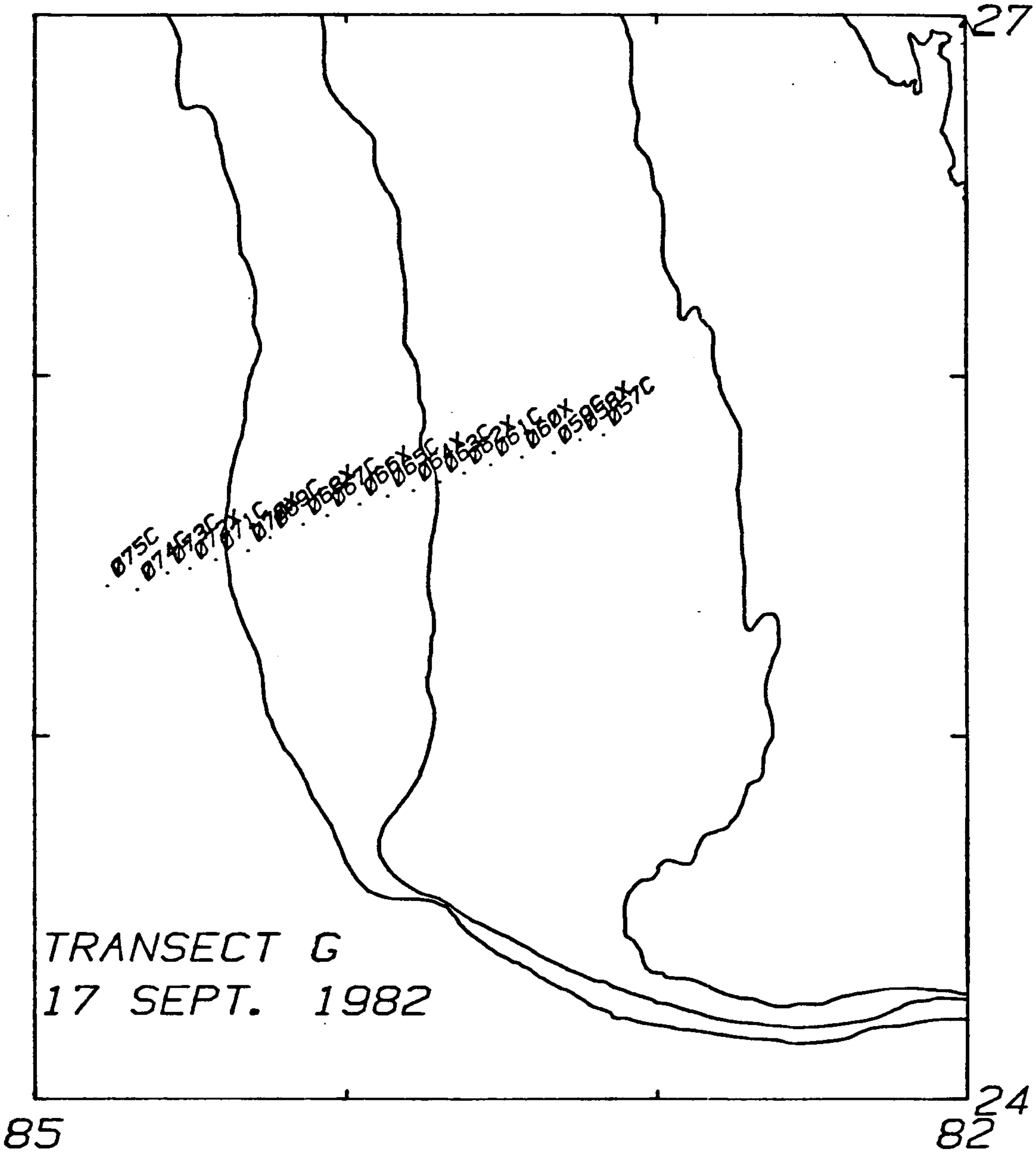

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Figure 2.8
Transect G Locations of XBT(X) and CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr HC

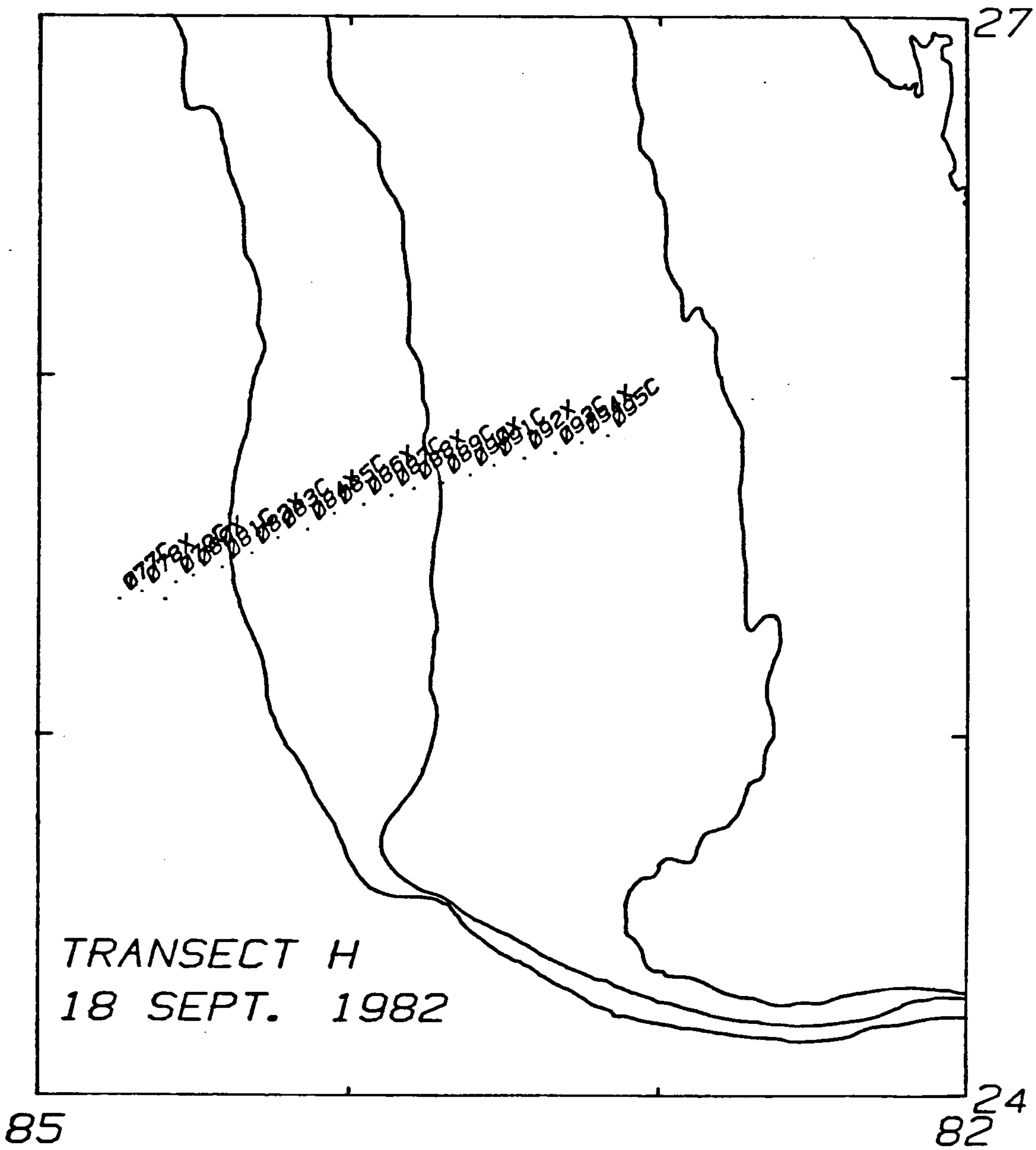

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Figure 2.9
Transect H Locations of XBT(X) and CTD(C) Stations

Proj 60834A	Date 10/20/82	Draft TMD	Appr HC

APPENDIX A

CHIEF SCIENTIST'S LOG

CHIEF SCIENTIST LOG, R.V. SUNCOASTER
September 12-19, 1982

Code	Measurement
1	CTD Cast*
2	Net Tow
3	Productivity Measurements
4	Hydro Cast
5	Light Cast
6	Quick CTD Cast†

12 September

0200 - Depart St. Petersburg, Florida

0500 - Return to St. Petersburg for ship repairs

1510 - Depart St. Petersburg, Florida

13 September

0140 -	Stn. 1	XBT; Surface temperature and chlorophyll
0225 -		Surface temperature and chlorophyll
0304 -	Stn. 2	XBT; Surface temperature and chlorophyll
0332		Surface temperature and chlorophyll
0404	Stn. 3	XBT; Surface temperature and chlorophyll
0443		Surface temperature and chlorophyll
0512	Stn. 4	XBT; Surface temperature and chlorophyll
0540		Surface temperature and chlorophyll
0606	Stn. 5	XBT; Surface temperature and chlorophyll

*Water analyzed for nutrient, oxygen, salinity and chlorophyll content

†Only measurements of conductivity, temperature and depth; no water samples taken with rosette

0644		Surface temperature and chlorophyll
0718	Stn. 6	XBT; Surface temperature and chlorophyll
0750		Surface temperature and chlorophyll
0819	Stn. 7	XBT; Surface temperature and chlorophyll
0854		Surface temperature and chlorophyll
0926	Stn. 8	XBT; Surface temperature and chlorophyll
1003		Surface temperature and chlorophyll
1036	Stn. 9	XBT; Surface temperature and chlorophyll
1220	Stn. 10	2, 3, 4, and 5
1543	Stn. 11	XBT; Surface temperature and chlorophyll
1644	Stn. 12	1
1727	Stn. 13	XBT; Surface temperature and chlorophyll
1805	Stn. 14	1
1929	Stn. 15	XBT; 4
2147	Stn. 16	XBT; Surface temperature and chlorophyll
2222	Stn. 17	XBT; 4
2335	Stn. 18	XBT; Surface temperature and chlorophyll

<u>14 September</u>

0013	Stn. 19	XBT; 4
0122	Stn. 20	XBT; Surface temperature and chlorophyll
0158	Stn. 21	XBT; 4
0310	Stn. 22	XBT; Surface temperature and chlorophyll
0342	Stn. 23	XBT; 3 and 4
0453	Stn. 24	XBT; Surface temperature and chlorophyll
0521	Stn. 25	XBT; 4
0650	Stn. 26	XBT; Surface temperature and chlorophyll

0720	Stn. 27	XBT; 1, 2 and 3
0948	Stn. 28	XBT; Surface temperature and chlorophyll
1055	Stn. 29	XBT; Surface temperature and chlorophyll
1218	Stn. 30	5
1511	Stn. 31	6; Surface temperature and chlorophyll
1609	Stn. 32	XBT; Surface temperature and chlorophyll
1644	Stn. 33	6; Surface temperature and chlorophyll
1800	Stn. 34	6; Surface temperature and chlorophyll
1915	Stn. 35	6; Surface temperature and chlorophyll
2030	Stn. 36	4 and 6; Surface temperature and chlorophyll
2230	Stn. 37	XBT; Surface temperature and chlorophyll
2320	Stn. 38	3,4 and 6; Surface temperature and chlorophyll

15 September

0117	Stn. 39	XBT; Surface temperature and chlorophyll
0214	Stn. 40	6; Surface temperature and chlorophyll
0408	Stn. 41	XBT; Surface temperature and chlorophyll
0443	Stn. 42	2, 3, 4 and 6
0640	Stn. 43	XBT; Surface temperature and chlorophyll
0728	Stn. 44	4 and 6
0914	Stn. 45	XBT; Surface temperature and chlorophyll
0945	Stn. 46	4 and 6
1135	Stn. 47	XBT; Surface temperature and chlorophyll
1230	Stn. 48	2, 3, 4, 5 and 6
1330		Began run to Ft. Myers for numerous repairs

1408	Stn. 49	XBT; Surface temperature and chlorophyll
1445	Stn. 50	XBT; Surface temperature and chlorophyll
1526	Stn. 51	XBT; Surface temperature and chlorophyll
1611	Stn. 52	XBT; Surface temperature and chlorophyll
1720	Stn. 53	XBT; Surface temperature and chlorophyll
1808	Stn. 54	XBT; Surface temperature and chlorophyll
1838	Stn. 55	XBT; Surface temperature and chlorophyll
1915	Stn. 56	XBT; Surface temperature and chlorophyll

<u>16 September</u>

0400		Arrive Ft. Myers, Florida
1030		Docked at Ft. Myers Beach, Florida and repairs begun on CTD winch and ship's radio
1930		Depart Ft. Myers Beach Dock and began run to the time series transect B

<u>17 September</u>

0446	Stn. 57	1 and 3
0543	Stn. 58	XBT; Surface temperature and chlorophyll
0615	Stn. 59	1
0717	Stn. 60	XBT; Surface temperature and chlorophyll
0755	Stn. 61	1
0850	Stn. 62	XBT; Surface temperature and chlorophyll
0920	Stn. 63	1
1014	Stn. 64	XBT; Surface temperature and chlorophyll
1044	Stn. 65	1, 2, 3, and 5
1235	Stn. 66	XBT; Surface temperature and chlorophyll
1301	Stn. 67	1

1440	Stn. 68	XBT; Surface temperature and chlorophyll
1508	Stn. 69	1
1623	Stn. 70	XBT; Surface temperature and chlorophyll
1655	Stn. 71	1, 2 and 3
1814	Stn. 72	XBT; Surface temperature and chlorophyll
1844	Stn. 73	1
2003	Stn. 74	XBT; Surface temperature and chlorophyll
2206	Stn. 75	1 and 3
2341	Stn. 76	1

18 September

0110	Stn. 77	1
0300	Stn. 78	XBT; Surface temperature and chlorophyll
0341	Stn. 79	1
0457	Stn. 80	XBT; Surface temperature and chlorophyll
0515	Stn. 81	1, 2 and 3
0653	Stn. 82	XBT; Surface temperature and chlorophyll
0730	Stn. 83	1
0848	Stn. 84	XBT; Surface temperature and chlorophyll
0930	Stn. 85	1
1040	Stn. 86	XBT; Surface temperature and chlorophyll
1115	Stn. 87	1, 2 and 3
1223	Stn. 88	XBT; Surface temperature and chlorophyll
1255	Stn. 89	1, 3 and 5
1408	Stn. 90	XBT; Surface temperature and chlorophyll
1441	Stn. 91	1
1543	Stn. 92	XBT; Surface temperature and chlorophyll

1628	Stn. 93	1
1717	Stn. 94	XBT; Surface temperature and chlorophyll
1750	Stn. 95	1

19 September

0700		Arrive St. Petersburg, Florida

APPENDIX B

STATION WEATHER DATA

WEATHER LOG

#	STA.	LAT		LONG		DATE	EST	Z(M)	WVD	SS	WND	WS	B.P.	AT	W
1	1x	26	52.9	83	46.9	13/9/82	0143	67	180	3	180	2	30.0	78	1
2	2x	26	44.0	83	44.0	13/9/82	0301	71	180	3	180	2	30.0	78	1
3	3x	26	37.0	83	41.0	13/9/82	0404	67	180	3	160	12	30.3	80	1
4	4x	26	28.0	83	38.9	13/9/82	0513	68	160	3	140	12	30.2	82	1
5	5x	26	22.1	83	35.0	13/9/82	0606	65	140	3	140	12	30.3	79	1
6	6x	26	13.1	83	32.0	13/9/82	0718	64	140	3	140	10	30.3	82	1
7	7x	26	5.0	83	30.0	13/9/82	0819	62	140	3	140	8	30.2	82	1
8	8x	25	57.1	83	26.0	13/9/82	0926	64	140	3	140	7	30.2	84	1
9	9x	25	48.0	83	24.0	13/9/82	1035	62	140	3	100	8	30.2	84	1
10	10b	25	50.0	83	0.0	13/9/82	1305	54	140	3	75	15	30.2	87	1
11	11x	25	48.8	83	15.4	13/9/82	1550	57	45	3	70	10	30.2	85	1
12	12c	25	47.1	83	20.0	13/9/82	1644	61	45	3	45	14	30.2	86	1
13	13x	25	46.0	83	26.0	13/9/82	1725	65	45	3	270	5	30.2	87	1
14	14c	25	45.0	83	32.2	13/9/82	1805	71	45	3	160	18	30.1	86	1
15	15xb	25	42.1	83	41.9	13/9/82	2050	90	45	3	70	12	30.2	86	1
16	16x	25	42.1	83	47.7	13/9/82	2150	106	45	3	70	10	30.2	84	1
17	17xb	25	40.0	83	52.0	13/9/82	2225	115	45	3	270	15	30.2	84	1
18	18x	25	38.5	83	57.5	13/9/82	2335	135	45	3	40	5	30.2	84	1
19	19xb	25	37.0	84	3.1	14/9/82	0010	144	90	3	90	20	30.2	84	1
20	20x	25	35.9	84	8.5	14/9/82	0122	153	140	3	90	5	30.2	84	1
21	21xb	25	33.3	84	14.1	14/9/82	0158	164	140	3	90	8	30.2	84	1
22	22x	25	31.9	84	19.6	14/9/82	0310	164	140	3	90	8	30.2	84	1
23	23xb	25	29.3	84	24.5	14/9/82	0342	217	140	3	90	20	30.2	84	5
24	24x	25	28.4	84	30.4	14/9/82	0453	437	140	3	90	5	30.3	84	2
25	25xb	25	27.2	84	34.4	14/9/82	0521	999	140	3	90	5	30.3	84	2
26	26x	25	24.8	84	41.4	14/9/82	0655	999	180	3	90	0	30.3	80	1
27	27c	25	24.9	84	45.1	14/9/82	0720	999	180	3	90	2	30.3	81	1
28	28x	25	31.8	84	47.5	14/9/82	0948	999	70	3	50	8	30.2	84	1
29	29x	25	39.4	84	49.7	14/9/82	1055	999	70	3	50	8	30.2	86	1
30	30c	25	47.6	84	52.8	14/9/82	1218	999	150	3	295	1	30.3	80	1
31	31c	25	50.1	84	48.1	14/9/82	1511	999	999	3	90	4	30.1	85	0
32	32x	25	47.8	84	53.2	14/9/82	1609	999	999	3	90	4	30.1	85	0
33	33c	25	46.0	84	57.9	14/9/82	1644	999	999	3	115	13	30.1	84	0
34	34c	25	38.6	84	58.3	14/9/82	1800	999	999	3	135	15	30.1	84	1
35	35c	25	29.7	84	55.0	14/9/82	1925	999	90	3	135	18	30.1	84	1
36	36c	25	20.5	84	53.1	14/9/82	2035	999	90	3	115	16	30.2	83	1
37	37x	25	21.0	84	48.7	14/9/82	2230	999	90	3	90	12	30.2	80	1
38	38c	25	24.1	84	45.0	14/9/82	2320	999	999	3	160	16	30.2	80	1
39	39x	25	23.4	84	38.0	15/9/82	0117	999	90	4	270	14	30.2	81	1
40	40c	25	25.2	84	33.5	15/9/82	0212	999	90	4	270	10	30.2	82	1
41	41x	25	26.3	84	27.1	15/9/82	0408	999	90	4	45	12	30.1	78	1
42	42c	25	27.9	84	25.1	15/9/82	0443	999	90	4	270	12	30.2	78	1
43	43x	25	30.8	84	18.9	15/9/82	0640	163	90	4	270	12	30.2	81	1
44	44c	25	33.3	84	14.1	15/9/82	0728	163	90	4	270	6	30.2	79	1
45	45x	25	35.2	84	8.6	15/9/82	0914	152	90	4	60	12	30.1	81	1
46	46c	25	36.2	84	3.3	15/9/82	0945	142	90	4	65	15	30.1	87	1
47	47x	25	38.5	83	57.3	15/9/82	1135	135	90	4	130	10	30.1	84	1
48	48c	25	40.0	83	52.0	15/9/82	1230	118	90	4	180	5	30.1	84	1
49	49x	25	41.4	83	47.4	15/9/82	1405	102	90	4	315	10	30.1	84	1
50	50x	25	42.3	83	41.8	15/9/82	1445	88	90	4	315	11	30.1	85	1
51	51x	25	43.5	83	36.5	15/9/82	1526	77	90	4	315	12	30.2	86	1
52	52x	25	44.8	83	31.8	15/9/82	1605	69	90	4	270	14	30.1	86	1
53	53x	25	50.3	83	24.9	15/9/82	1720	64	90	4	270	14	30.1	84	1
54	54x	25	46.9	83	30.3	15/9/82	1800	60	90	3	225	8	30.1	84	1
55	55x	25	48.1	83	15.1	15/9/82	1840	56	90	3	315	19	30.1	83	1
56	56x	25	50.0	83	10.2	15/9/82	1915	52	45	3	300	22	30.1	82	1
57	57c	25	50.1	83	10.4	17/9/82	0446	55	305	2	320	10	30.1	79	0
58	58x	25	49.3	83	15.0	17/9/82	0543	58	305	2	320	10	30.1	80	0
59	59c	25	47.1	83	20.0	17/9/82	0615	61	180	2	350	3	30.1	83	0
60	60x	25	46.3	83	26.2	17/9/82	0717	65	180	2	350	3	30.1	79	0
61	61c	25	45.0	83	36.2	17/9/82	0755	69	180	2	350	3	30.1	81	0
62	62x	25	43.6	83	37.3	17/9/82	0850	73	180	2	350	3	30.1	87	0
63	63c	25	42.2	83	41.9	17/9/82	0920	88	180	2	350	3	30.1	87	0
64	64x	25	40.8	83	47.0	17/9/82	1014	102	180	2	350	3	30.1	88	0
65	65c	25	39.9	83	52.0	17/9/82	1044	117	180	2	350	3	30.1	89	0

66	66x	25	37.1	83	59.4	17/9/82	1235	135	82	2	40	2	30.1	90	0
67	67c	25	36.6	84	3.6	17/9/82	1301	145	82	2	60	15	30.1	88	0
68	68x	25	34.6	84	10.0	17/9/82	1440	156	74	2	0	2	30.1	90	0
69	69c	25	33.0	84	14.7	17/9/82	1508	162	74	2	360	4	30.1	90	0
70	70x	25	32.5	84	20.2	17/9/82	1622	159	78	2	360	4	30.1	89	0
71	71c	25	28.6	84	25.1	17/9/82	1740	203	80	2	60	13	30.1	88	0
72	72x	25	27.9	84	30.2	17/9/82	1814	484	80	2	60	10	30.1	88	0
73	73c	25	27.1	84	34.4	17/9/82	1844	999	80	2	60	10	30.1	84	0
74	74c	25	24.4	84	40.2	17/9/82	2003	999	80	2	60	15	30.1	82	0
75	75c	25	25.0	84	46.0	17/9/82	2206	999	80	2	50	13	30.1	82	3
76	76c	25	32.0	84	48.0	17/9/82	2340	999	80	2	50	13	30.1	82	3
77	77c	25	22.5	84	44.3	18/9/82	0155	999	180	2	120	7	30.1	82	1
78	78x	25	23.8	84	38.2	18/9/82	0258	999	180	2	120	7	30.1	81	1
79	79c	25	25.5	84	33.6	18/9/82	0421	999	180	2	120	7	30.1	80	1
80	80x	25	26.7	84	28.8	18/9/82	0457	445	180	2	120	7	30.1	80	1
81	81c	25	29.0	84	24.9	18/9/82	0515	204	180	2	120	11	30.1	79	1
82	82x	25	30.5	84	18.9	18/9/82	0653	159	80	1	50	8	30.1	82	1
83	83c	25	33.0	84	13.9	18/9/82	0730	163	80	1	50	8	30.1	83	1
84	84x	25	34.4	84	8.1	18/9/82	0848	149	999	1	80	6	30.1	83	1
85	85c	25	37.0	84	3.0	18/9/82	0930	143	999	1	80	6	30.1	89	1
86	86x	25	38.6	83	57.0	18/9/82	1027	130	999	1	80	6	30.1	84	1
87	87c	25	40.0	83	51.9	18/9/82	1115	116	999	1	80	6	30.1	85	1
88	88x	25	41.1	83	44.6	18/9/82	1223	101	999	1	80	4	30.1	84	1
89	89c	25	42.1	83	42.0	18/9/82	1254	90	999	1	80	4	30.1	87	1
90	90x	25	43.4	83	36.7	18/9/82	1410	73	999	1	80	4	30.1	87	1
91	91c	25	45.0	83	32.1	18/9/82	1504	71	999	0	89	4	30.1	89	1
92	92x	25	46.2	83	26.2	18/9/82	1544	65	999	0	85	4	30.1	89	1
93	93c	25	47.0	83	20.2	18/9/82	1625	61	999	1	85	13	30.0	91	1
94	94x	25	48.8	83	15.1	18/9/82	1717	56	999	1	85	13	30.0	86	1
95	95c	25	50.0	83	10.0	18/9/82	1750	55	999	2	85	13	30.0	84	1

= disc record

Station = assigned station number

Latitude and longitude

Date and time in eastern standard time

Z = water depth in meters

WVD = wave direction

SS = SEA STATE

WND = wind direction

WS = Wind Speed(knots)

B.P. = barometric pressure in millibars(tens, units and tenths only)

AT = air temp in F(not very good #)

W = WMO weather code

999's indicate no data

APPENDIX C-1

SUMMARY OF HYDROGRAPHIC MEASUREMENTS

Appendix C-1. Summary of Hydrographic Measurements

Number of Stations				Number of Sections			
Transect	CTD	XBT	Bottle Cast	Nut	O_2	Chl	Salinity
A	0	9	0	0	0	17	0
*B	3	14	7	76	76	86	59
C	1	2	0	0	0	2	1
D	2	1	0	0	0	3	2
E	1	0	1	10	10	3	1
**F	7	14	7	56	56	72	7
G	12	8	0	90	90	85	11
H	10	9	0	82	82	98	9

* A combination of XBT cast and bottle cast was used during repairs to the CTD
** Bottle casts were used to obtain water samples at discrete depths during the malfunction of the rosette

APPENDIX C-2

SUMMARY OF PRIMARY PRODUCTIVITY MEASUREMENTS AND PHYTOPLANKTON CELL COUNT SAMPLES

Appendix C-2. Summary of Primary Productivity Measurements and Phytoplankton Cell Count Samples

Station	Productivity (No. of Depths)	Cell Counts (No. of Depths)
10	6	4 + net tow
17	6	0
23	6	0
27	6	5 + net tow
38	6	0
42	6	5 + net tow
48	6	5 + net tow
57	6	0
65	6	5 + net tow
71	6	5 + net tow
75	6	0
81	6	5 + net tow
87	6	5 + net tow
89	6	0
	84 (14 stations)	39 (8 stations)

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.