Florida Power
CORPORATION

June 11, 1984
3F0684-08

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
Attention: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Environmental Protection Agency 316 Study

Dear Mr. Denton:

Attached are two letters (dated June 4 and June 7, 1984) which have been submitted to the Environmental Protection Agency and are hereby transmitted in accordance with Crystal River Unit 3 Technical Specifications, Appendix B, Part II, Section 3.2.

If there are any question concerning this information, please contact this office.

Sincerely,

G. R. Westafer

G. R. Westafer
Manager, Nuclear Operations
Licensing and Fuel Management

Attachments

DVH/ddl

cc: Mr. J. P. O'Reilly
Regional Administrator, Region II
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, GA 30323

A001
1/1
ADD: NRR/DE/AEAB
NRR/DE/EEB
NRR/DE/EHEB
NRR/DE/SAB

Florida Power
CORPORATION

June 4, 1984

Mr. Charles Kaplan
ENVIRONMENTAL PROTECTION AGENCY
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Kaplan,

Enclosed is a copy of the Notes of Conference from our Third Quarterly Progress Meeting held on May, 3, 1984. Should you have any comments or questions regarding these notes, please let me know.

As you requested during the Quarterly Meeting and in subsequent correspondence, enclosed is a map showing the pre-established location of sampling stations for the August and January plume delineation (intensive) surveys. A loran grid is provided on the map for your use. During the plume delineation surveys, data were collected as close as possible to the fixed station locations. However, due to tidal variation, difficulties with nighttime navigation, etc., not all data was collected at the exact station location. When this occurred, the loran coordinates for the actual sampling points were recorded. Loran coordinates for each sample collected will be presented along with a tabular listing of the field data in the final report.

Also enclosed in this package are two copies of a bathymetry chart for the Crystal River discharge basin. One copy of this chart has been reduced in scale to equal that of the intensive survey sampling station locations. I hope the bathymetry drawing will be of some use to you.

Regarding other information requested in your May 10, 1984, correspondence, Florida Power Corporation realizes the need to provide agency personnel the materials required to verify that the 316 Study is being conducted in accordance with the Plan of Study and Standard Operating Procedures. However, as we have previously discussed, Florida Power feels it is premature to analyze results and draw conclusions regarding the study while data continues to be collected. The data requests detailed in your letter will be provided in the Final Report. To ensure that the study results are presented in a useable, yet cost effective manner, discussions similar to those occurring at the Quarterly Meetings should continue at the Quarter 4 Progress Meeting. In the interim, feel free to contact me should you have any questions regarding the 316 Study.

Sincerely,

FLORIDA POWER CORPORATION

P. J. Behrens by DKV

Paul J. Behrens
Environmental Scientist

NOTES OF CONFERENCE
THIRD QUARTERLY PROGRESS MEETING
FLORIDA POWER CORPORATION

J.O.No. 14498

Held in the Offices of
Florida Power Corporation
St. Petersburg, FL
May 3, 1984

Present for:

Florida Power Corporation (FPC)

P. Behrens
D. Voigts

U.S. Environmental Protection Agency (EPA)

D. Hicks*
C. Kaplan*

Florida Department of Environmental Regulation (DER)

D. Farrell*
L. Olsen
S. Palmer

Mote Marine Laboratory (MML)

K. Mahadevan

Stone & Webster Engineering Corporation (SWEC)

J. Downing
T. Folger
T. Horst
D. McDougall
T. Biffar

*Part-time

PURPOSE

The meeting constituted the Third Quarterly Progress Meeting for the Crystal River NPDES 316(a) and (b) Studies.

DISCUSSION

Attachments 1 and 2 provide the meeting agenda and the attendance list. C. Kaplan and D. Hicks were delayed; events to that point were summarized on their arrival. Items of interest or concern to D. Farrell and his comments on the program were addressed prior to his early departure.

K. Mahadevan summarized the status of field collections and laboratory analysis. In general, the program is going well and is on schedule. Some oyster stations are experiencing sedimentation but attempts are being made to regularly clear the cages. One more set of aerial photographs will be attempted in early summer. The fisheries and impingement programs end in May. Thermograph returns are good now but higher loss rates are anticipated in May and June. DER considers the summer thermograph data necessary to define a mixing zone (surface and bottom).

Crab tag returns are still active so no cutoff date has been set. It was suggested that July 1, 1984 be used with subsequent returns listed as a supplement. The DER is concerned with the adequacy of the data to define crab movement, particularly through Fishermen's Cut and it would also like to integrate DNR data on coastal migration with FPC data. These data are not presently available and their existence in a compatible form and timely delivery would be necessary for the data to be included in the analysis of the present data. D. Farrell agreed to contact DNR concerning these data and will call K. Mahadevan by May 18, 1984. The feasibility of using the data would then be evaluated. DER is, in part, trying to evaluate the effect of the Crystal River power plants on coastal crab migration; this is beyond the present scope of the present study which was intended only to determine local effects of the dikes.

An analysis by benthic core replicate sampling was completed on the data from the first three sampling dates. The analyses indicated that replication is adequate overall despite a few stations exceeding standards. Further analyses will be conducted; D. Farrell suggested special emphasis on samples from February and March.

Comments were solicited concerning the summary of final analyses that was provided in the progress report. L. Olsen indicated that analyses of interest to him were largely covered. For benthos, he prefers summary figures showing density, species richness and H' by station and sampling period (quarterly data are sufficient with six week data necessary only to confirm trends) to matrices. D. Farrell noted the need to add conductivity to the parameters listed for benthic analysis due to its effect on Shannon-Weaver results. L. Olsen would like to see color coding or overlays for macrophyte maps.

Groupings for benthic analysis will be based on statistical analysis and common sense. Items to be considered include: sediment characteristics, control and thermal areas; and near shore and offshore location. The data resulting from these groupings will be used to confirm study design. Reduced, summary data should be presented as appendices to the final report to: a) provide ready access to data, and b) show the basis for correlations and other conclusions in text. The "life styles" of organisms will be addressed and analyses reported much as was done for Big Bend Station. D. Hicks outlined a desirable approach as: 1) define trends in benthos, 2) look for driving mechanisms, and 3) base impact evaluations on worst case temperature predictions.

L. Olsen indicated that impingement is a limited concern at this site as local fisheries pressure is probably more significant. The entrainment analysis will use T. Horst's model but the fisheries area to be used for comparison with the model's predictions is not yet defined. Suggestions were requested but no obvious choice emerged. Crystal River landings may be available and T. McIlwain at Ocean Springs may be able to offer suggestions.

The source term analysis was defined and the form of results discussed. It was stressed that it is a modeling approximation since organism movement is not modelled. The mechanisms simulated will be advection (transport due to currents) and dispersion (transport due to mixing). The model is expected to generate results which identify regions from which organisms originate. D. Farrell indicated that he is comfortable with the analyses proposed for impingement, entrainment, and fisheries.

DER regulations for a thermal mixing zone are in °F so at a minimum, D. Farrell would like to have the 2°F isotherm added to presentations of plume predictions. Bottom detachment is important as are representations of worst case surface and bottom conditions. It was noted that the near-field model would address bottom detachment but far-field modeling provides a vertically integrated value. D. Hicks noted that he does not believe statification is a problem at this site based on available data. Precision in locating isotherms of lower ΔT's is limited as small changes in temperature result in large changes in isotherm location; it is far easier to report what the temperature is at a given location. An indication of the accuracy of model results will be in the final report. A plant load data summary should accompany field temperature sampling data; C. Kaplan is interested in related point of discharge (POD) temperatures. P. Behrens provided the data to C. Kaplan during the meeting.

The August and January plume delineation surveys were discussed. Stations were marked by buoys but did vary from one circuit to the next based on tidal conditions, problems locating stations at night, etc. Loran was used to locate stations not at buoys. A map should be provided showing station locations and depths.

There are a few errors in the existing data tables (salt marsh, temperature, entrainment). Corrections were made available at the meeting and marked pages will be sent out shortly. C. Kaplan believes there are still some outliers in the temperature tables and would like to have more information regarding these data including: tidal phase and tide level sampled, station depth, time of tide window, and time of sampling by station.

D. McDougall discussed the status of the hydrodynamic and hydrothermal modeling. The topics covered at the April 4 meeting on this subject with EPA and DER were summarized. Ambient temperature conditions as modeled were defined to include circulating water system operation with no plant heat rejection. The use of salinity to calibrate and verify the models was emphasized; this provides a more effective parameter than temperature as atmospheric exchange does not exist. S. Palmer agreed with this approach. The final product will be a representation of ΔT's, at 4 phases of the tide, at 2 plant loads, and for 2 seasons. C. Kaplan questioned the adequacy of

providing results for only 2 plant load conditions but no specific suggestions were provided. S. Palmer stated that total temperature is a concern and that there are several ways to get it. However, it is understood that the model produces ΔT's. T. Horst noted that after correlating temperature with benthos data, it should be possible to identify ΔT's of interest and then use predicted ΔT information rather than going through the considerable effort of developing actual temperatures from the ΔT's modeled. Where varying loads are of concern, it is possible to take the measured field values, subtract the ΔT for a measured load and then add the ΔT for an extrapolated load. Such a procedure may be desirable to meet regulatory concerns but is not necessary to complete the impact evaluation.

The use of average or maximum temperature was discussed. Averages will be used for impact assessment but definition of impacted area should consider full-load plant operation to project the worst case. Thermographs may give a stronger record of average temperature than the weekly results but the weeklies tend to overestimate impacts at a given temperature. In general, the average differences between stations should be sufficient for our needs and weekly data will be used for comparisons.

Since FPC has temperature limits at the point of discharge, plant operations are controlled to achieve the limits. Various load conditions can be modeled, however, hydrodynamic conditions monitored during the calibration and verification period carry through to the predictions. Looking at other conditions for worst case is not presently part of the program. The conditions of "worst case" plume, given 102°F at the POD, need to be defined and evaluated regarding the impacts to biota.

C. Kaplan indicated that for his evaluation he would like to have a map showing benthic and thermograph stations and an overlay grid. C. Kaplan and D. Hicks then reviewed concurrent thermograph and weekly temperature data. They were able to conclude that the weekly temperature data provided an adequate representation of conditions and would not underestimate temperatures. As a result, C. Kaplan will send a letter to FPC stating that three additional months of thermograph data will not be necessary.

TABiffar:MTD

ATTACHMENT 1

AGENDA

THIRD QUARTERLY PROGRESS MEETING

CRYSTAL RIVER NPDES STUDIES

1. Introduction - P. Behrens
2. Field Work and Laboratory Analysis - S. Mahadevan
3. Hydrodynamic and Hydrothermal Modeling - D. McDougall
4. Data Tables and Display - T. Biffar
5. Summary of Final Analysis - T. Horst

ATTACHMENT 2

Paul Behrens	Florida Power
David Voigts	Florida Power
Tom HORST	STONE & WEBSTER
JOHN DOWNING	STONE & WEBSTER
Lawrence Chen	F.D.E.R. - Biology
Sue talmer	FDER - Water Quality Analysis
Tony Farrell	FDER - TAMPA
Thomas A. Folger	Stone & Webster
David W. McDougall	Stone & Webster
Kumar Mahadevan	Mote Marine Laboratory
TOM BIFFAR	STONE & WEBSTER
Charles Kaplan	EPA Atlanta
Del Nicks	" Athens.

SURFACE AND BOTTOM TEMPERATURES (DEGREES C) BY STATION AND WEEK OF JUNE 1983

STATION	JUNE 9, 1983		JUNE 15, 1983		JUNE 22, 1983		JUNE 30, 1983	
	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM
1	29.0	28.9*	28.9	28.3*	30.4	30.4*	29.2	29.2*
2	29.2	29.1*	28.2	27.7	30.4	30.4*	29.8	29.9*
3	29.2	28.5*	28.3	27.4	29.6	29.4*	30.3	30.1*
4	28.6	28.4	27.7	28.1*	29.4	29.1	30.4	30.5
5	28.5	28.3	27.7	28.2*	29.6	29.4	30.4	30.6
6	28.3	19.4	27.8	27.6	29.6	29.2	30.4	30.3
7	28.6	22.5	27.8	27.7	29.5	28.9	30.4	30.4
8	28.8	28.5	28.0	27.7	29.4	28.6	30.6	30.3
9	28.9	28.6*	28.0	27.4	28.4	28.4*	31.2	30.6
10	28.8	28.7*	28.2	27.7	29.6	28.4*	30.9	29.9
11	28.9	28.7*	28.2	28.0	28.1	28.1*	30.2	29.9
12	29.0	28.7*	28.4	28.0	28.3	28.3*	30.3	29.9
13	29.8	30.0	29.7	29.4	32.6	32.6	31.3	31.3
14	28.5	28.5	29.0	29.0*	30.2	30.5	30.9	31.1
15	28.9	28.1*	28.7	28.3*	29.8	29.0	30.8	30.5
16	28.9	28.4*	28.7	27.9*	29.2	28.8*	30.9	30.4
17	31.5	31.5	30.1	30.1*	34.1	33.8	31.7	31.7
18	30.3	30.1	30.2	31.4	32.1	32.0*	33.3	33.1
19	29.1	29.3	29.8	31.6	31.9	31.9*	32.2	32.2*
20	28.7	28.8	29.4	30.2	29.8	29.5*	31.7	31.1
21	28.8	28.3*	29.1	29.8*	29.7	29.2*	31.2	30.5
22	28.8	28.3*	29.1	38.1*	28.5	28.8*	32.2	30.3
23		*	28.4	27.8*	28.5	28.1	31.6	29.6
24	27.8	28.0*	28.1	27.8*	28.3	28.2*	30.2	29.6
25	28.8	28.2*	28.1	28.0	28.1	28.1*	30.1	29.7
26	28.9	28.1*	28.4	28.0	28.3	28.1*	30.0	29.7
27	29.2	29.3	28.0	28.0	29.3	29.2	30.5	30.7
28	29.6	29.3	28.1	28.3	30.8	29.6*	31.5	31.0
29	28.9	28.9	29.3	29.5	28.6	28.6*	33.2	31.3
30	28.4	28.1*	28.9	28.4	28.5	28.5*	31.9	30.2
31	28.2	28.2	28.2	27.2	28.9	28.8	30.4	30.4*
32	28.3	28.2	27.9	27.9*	28.9	28.9	30.6	30.4*
33	28.2	28.2*	28.1	27.4*	28.4	28.4*	30.6	30.1*
34	28.5	28.2*	28.0	27.3*	28.4	28.4*	30.6	30.2*
35	29.2	28.8*	28.3	28.0	28.9	28.6*	29.9	29.6*
36	28.6	28.6*	28.2	28.1	28.8	28.6*	24.9	27.8*
37	28.7	28.7*	28.8	28.1	28.6	28.5*	30.2	29.8*
38	28.5	28.2*	28.9	28.6*	28.9	28.9*	29.6	29.7*
39	28.6	28.3*	27.9	27.2*	29.1	28.8*	29.9	29.8*
40	28.9	28.6*	28.3	28.0*	28.8	28.4	30.7	29.9

* OUTSIDE TIDE WINDOW

SURFACE AND BOTTOM CONDUCTIVITY (MMHOS/CM) BY STATION AND WEEK OF JUNE 1983

STATION	JUNE 9, 1983		JUNE 15, 1983		JUNE 22, 1983		JUNE 30, 1983	
	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM
1	27.2	27.5*	18.0	23.3*	19.8	19.5*	16.1	21.2*
2	28.9	29.9*	24.3	27.9	30.6	30.8*	27.0	35.8*
3	29.0	39.4*	26.9	31.7	39.4	40.4*	33.0	43.5*
4	26.1	30.2	26.5	35.8*	32.7	36.3	31.6	38.5
5	23.4	31.5	28.1	35.0*	34.3	38.8	33.0	39.3
6	28.1	32.4	28.0	30.8	36.3	38.9	28.8	39.4
7	31.9	37.6	28.8	35.3	40.3	40.5	37.3	44.0
8	33.7	37.2	30.8	35.1	41.0	41.3	36.4	44.6
9	32.6	38.9*	31.9	35.5	42.8	42.9*	41.4	43.0
10	38.5	41.7*	33.6	39.2	44.0	44.7*	43.9	46.1
11	38.2	41.3*	34.5	41.8	47.0	46.8*	47.7	49.1
12	39.7	41.9*	38.6	42.8	49.3	49.1*	51.2	50.5
13	34.6	35.5	35.5	37.5	46.7	46.7	41.2	41.5
14	32.2	32.3	29.7	36.5*	41.7	43.3	35.3	42.8
15	32.1	36.4*	31.8	35.9*	42.7	42.6	36.4	45.3
16	35.2	39.6*	35.1	39.6*	45.7	.8*	44.5	44.9
17	37.9	38.0	42.1	42.1*	47.8	47.6	46.9	46.9
18	35.3	35.5	39.7	43.6	46.3	26.6*	48.5	48.4
19	34.7	35.1	38.8	43.9	46.1	46.1*	47.2	47.2*
20	34.3	36.1	37.1	41.3	43.2	43.3*	43.5	45.3
21	34.1	36.8*	33.3	32.7*	43.3	43.2*	41.1	45.5
22	34.6	38.0*	33.7	39.5*	43.7	44.9*	45.2	45.8
23		*	37.3	38.4*	44.9	44.7	46.3	46.3
24	37.7	32.6*	35.0	39.9*	46.7	46.7*	46.7	48.9
25	39.0	42.0*	37.8	42.3	47.8	48.0*	50.6	50.7
26	39.9	43.9*	41.7	43.5	48.8	49.2*	51.2	51.4
27	35.5	35.5	35.2	35.3	40.8	40.7	42.6	43.4
28	35.2	35.8	36.5	37.8	44.2	42.8*	45.3	43.5
29	36.9	37.2	37.4	39.8	44.1	44.1*	47.4	44.9
30	37.8	37.7*	37.8	37.4	44.6	44.6*	45.6	45.2
31	33.2	33.4	30.6	36.5	38.0	38.1	33.3	34.1*
32	34.0	34.2	35.5	35.5*	38.5	38.6	32.8	33.2*
33	36.4	36.5*	38.0	39.2*	38.5	38.8*	34.6	37.9*
34	38.3	39.3*	39.1	41.2*	41.8	41.8*	38.5	41.5*
35	40.0	41.2*	39.4	41.6	46.8	47.2*	43.1	48.9*
36	40.2	40.2*	43.9	43.8	47.9	48.2*	49.8	49.9*
37	42.9	42.8*	44.8	45.3	48.8	48.6*	50.0	50.8*
38	27.3	31.3*	25.2	25.1*	34.7	34.8*	28.6	36.9*
39	33.1	34.9*	34.7	38.5*	42.1	43.3*	34.1	37.1*
40	38.4	43.6*	41.4	44.7*	47.2	46.9	43.7	48.6

* OUTSIDE TIDE WINDOW

SURFACE AND BOTTOM TEMPERATURES (DEGREES C) BY STATION AND WEEK OF JULY 1983

STATION	JULY 7, 1983 SURFACE	JULY 7, 1983 BOTTOM	JULY 12, 1983 SURFACE	JULY 12, 1983 BOTTOM	JULY 20, 1983 SURFACE	JULY 20, 1983 BOTTOM	JULY 26, 1983 SURFACE	JULY 26, 1983 BOTTOM
1	30.4	30.6*	30.6	30.3*	31.6	31.6*	29.0	29.0*
2	30.3	30.9*	30.3	30.2*	31.6	31.2*	28.9	28.9*
3	30.5	30.7*	30.2	30.0*	31.2	31.0*	29.4	29.4*
4	30.5	31.1	29.6	30.3	31.2	32.3*	28.7	29.0
5	30.6	31.4	29.6	30.3	31.7	31.5	29.0	29.0
6	30.9	31.1	29.8	29.8	31.5	31.9	29.0	29.1
7	31.4	31.1	29.8	29.8	31.1	31.3	29.1	29.0
8	31.3	31.0*	30.1	30.2	31.2	31.1	28.9	29.2
9	31.8	31.0*	30.2	30.1	31.1	31.0	29.3	29.5
10	30.5	30.5	30.5	30.5	30.6	30.7	29.8	30.0
11	30.5	30.5	30.0	30.0	30.8	30.8	29.9	29.9
12	30.5	30.5	30.0	30.0	31.0	30.8	29.9	30.1
13	32.7	32.6	31.0	30.8	32.3	33.4	29.3	29.3
14	32.3	32.0	30.8	31.3	31.7	31.8	29.3	30.4
15	31.6	30.9	30.3	30.3	31.4	31.0	29.6	29.9
16	30.5	30.5	30.5	30.0	30.5	30.8	29.9	29.9
17	33.0	33.4	30.9	30.9	33.7	33.8	29.1	29.1
18	32.5	32.8	32.2	31.3	32.1	33.6	29.5	30.7
19	32.4	32.4	31.6	31.7	31.7	33.9	30.1	31.6
20	32.3	31.4	31.8	31.6*	30.9	30.9	29.7	31.8
21	31.8	31.2	31.7	31.6*	30.8	30.8	29.5	32.3
22	31.3	30.8	31.5	30.7*	30.8	30.9	29.7	31.1
23	31.0	30.5	31.5	30.5	30.8	30.9	30.4	30.7
24	30.5	30.5	30.0	30.0	31.0	30.9	30.2	30.1
25	30.5	30.5	30.0	30.0	30.8	30.8	29.8	29.8
26	30.5	30.5	30.0	30.0	30.7	30.7	29.8	29.9
27	32.2	30.9	29.5	29.6	30.6	31.0	30.0	29.0
28	32.1	33.0	29.8	29.8	31.3	33.2	29.8	29.5
29	31.5	31.2	32.0	32.2	31.1	31.0	30.7	31.8
30	31.3	31.0	31.3	31.2	30.9	30.8	30.7	30.8
31	31.0	30.9	29.9	30.0*	30.5	30.6*	29.1	29.1*
32	31.3	31.0	30.2	30.2*	30.7	30.7*	29.3	29.3*
33	31.3	30.9*	30.0	30.0*	30.9	30.8*	29.5	29.5*
34	31.5	30.8*	30.5	30.1*	31.2	31.1*	29.7	29.7*
35	30.0	29.8*	30.0	30.0*	31.2	31.1*	30.0	30.0*
36	30.0	29.5*	30.0	30.0*	31.1	31.0*	30.0	30.0*
37	29.8	29.0*	30.5	30.5*	31.1	30.9*	30.1	29.9*
38	30.5	30.5*	30.1	30.1*	30.8	30.8*	29.3	29.2*
39	30.7	30.6*	29.7	30.0*	31.0	30.6*	29.2	29.3
40	31.0	30.5	30.5	30.0*	31.2	31.1*	30.1	30.0*

* OUTSIDE TIDE WINDOW

BENTHOS

JUNCUS MARSH DENSITY, BIOMASS, AND HEIGHT

OCTOBER 1983

STATION

LOCATIONS	UPPER SALT CREEK	LOWER SALT CREEK	CONTROL	MIDWAY	THERMAL	THUMB ISLAND	FENCE	DAVIS ISLAND
1								
LIVE HEIGHT	.	.	.	.	.	.	.	.
LIVE WEIGHT	153.990	182.067	254.600	57.220	278.700	96.827	325.567	300.967
LIVE DENSITY	83.000	68.000	113.333	24.667	100.333	53.000	92.333	76.333
DEAD WEIGHT	154.867	40.193	37.467	17.593	151.567	46.767	127.933	90.753
2								
LIVE HEIGHT	.	.	.	.	.	.	.	.
LIVE WEIGHT	179.367	201.207	320.800	296.000	156.600	197.650 067	214.333	153.190
LIVE DENSITY	120.667	87.667	115.333	96.333	66.333	53.000 667	64.667	48.333
DEAD WEIGHT	143.667	155.657	134.813	79.067	78.890	103.035 81.007	134.580	79.440
3								
LIVE HEIGHT	.	.	.	.	.	.	.	.
LIVE WEIGHT	179.033	222.700	150.230	512.200	102.320	265.200	247.833	154.133
LIVE DENSITY	67.333	89.333	64.000	190.333	48.333	79.667	72.667	74.667
DEAD WEIGHT	96.567	123.633	164.880	206.667	67.593	118.433	104.693	86.077
4								
LIVE HEIGHT	.	.	.	.	.	.	.	.
LIVE WEIGHT	235.533	197.300	252.967	312.500	185.637	281.833	239.433	195.400
LIVE DENSITY	108.333	72.000	77.333	83.667	113.333	118.333	60.667	53.667
DEAD WEIGHT	144.100	107.937	230.860	88.233	96.187	171.500	106.280	75.363

ENTRAINMENT

DENSITY BY STATION

NUMBER PER 100 CUBIC METERS

JULY 21, 1983

SPECIES NAME	STATION A	B	C	D	E	F	G	H	I	J	K
FAMILY CLUPEIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.290	0.418	0.000	0.270
HARENGULA JAGUANA	0.882	0.000	0.230	0.000	0.000	0.938	0.000	4.597	14.150	2.290	9.172
OPHISTHONEMA OGLINUM	6.618	5.187	19.735	64.317	6.898	9.097	70.677	98.435	467.632	127.448	500.538
FAMILY ENGRAULIDAE	4.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ANCHOA HEPSETUS	74.867	64.465	32.072	2.333	3.782	21.697	42.463	30.950	36.868	32.833	48.642
ANCHOA MITCHILLI	148.440	398.578	112.218	195.195	54.005	1670.04	3777.53	174.368	73.310	33.608	54.230
ANCHOA SP.	270.883	107.445	69.100	110.202	34.938	76.250	184.400	191.197	314.745	71.767	130.845
GOBIESOX STRUMOSUS	0.000	0.345	0.000	0.000	0.760	0.372	0.000	0.000	0.000	0.240	0.000
HEMIRHAMPHUS BRASILIENSUS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.270
HYPORHAMPUS UNIFASCIATUS	0.000	0.000	0.000	0.000	0.000	0.848	0.000	0.467	0.515	0.415	0.322
MEMBRAS MARTINICA	0.000	0.000	0.115	0.467	0.000	0.000	0.000	0.000	0.000	0.240	0.000
MENIDIA BERYLLINA	0.000	0.000	0.115	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.000
HIPPOCAMPUS ERECTUS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.278
HIPPOCAMPUS ZOSTERAE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.352	0.270
MICROGNATHUS CRINIGER	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.278
SYNGNATHUS FLORIDAE	1.778	0.125	0.252	0.000	0.000	0.445	0.640	0.145	0.557	1.698	1.183
SYNGNATHUS LOUISIANAE	0.222	0.000	0.000	0.000	0.000	0.000	0.000	0.140	0.517	0.000	0.585
SYNGNATHUS SCOVELLI	0.000	0.000	0.278	0.000	0.760	0.000	0.000	0.000	0.233	0.000	0.233
CHLOROSCOMBRUS CHRYSURUS	13.363	0.373	0.000	1.295	0.000	0.817	0.630	3.818	1.567	0.340	1.465
OLIGOPLITES SAURUS	2.330	0.720	0.762	1.230	1.517	1.255	0.572	5.777	1.502	0.713	1.490
EUCINOSTOMUS SP.	0.000	0.123	0.115	0.388	0.000	0.000	0.150	0.000	0.138	0.232	0.558
FAMILY SCIAENIDAE	189.750	0.000	310.423	431.567	306.167	8.033	52.813	278.567	181.017	1218.17	630.000
BAIRDIELLA CHRYSOURA	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.717	0.857	0.240	0.000
CYNOSCION ARENARIUS	9.475	0.373	0.000	0.388	0.000	0.000	1.162	30.542	5.038	0.767	4.488
CYNOSCION NEBULOSUS	1.152	0.625	1.042	3.303	2.563	3.455	1.202	5.105	11.133	54.667	8.570
MENTICIRRHUS SAXATILIS	0.222	0.302	0.252	0.000	0.000	0.000	0.000	2.667	0.467	0.000	0.000
MENTICIRRHUS SP.	3.473	0.473	1.580	0.895	0.823	1.637	4.507	5.710	7.973	2.647	6.452
CHAETODIPTERRUS FABER	0.235	0.248	0.505	0.428	0.760	0.000	1.992	5.338	4.840	1.647	5.505
PARACLINUS FASCIATUS	0.153	0.748	1.258	2.195	0.000	5.592	0.000	0.723	5.963	7.070	1.565
FAMILY BLENNIIDAE	0.000	0.000	0.000	0.000	0.760	0.000	0.000	0.000	0.000	0.000	0.000
UNIDENTIFIED BLENNY	1.033	5.490	6.002	5.228	4.483	13.192	1.892	1.207	0.280	69.610	3.735
FAMILY CALLIONYMIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.720	0.000	1.540	0.558
FAMILY GOBIIDAE	65.733	1.617	1.565	0.000	0.600	1.657	0.120	2.253	0.000	0.465	0.322
BATHYGOBIUS SOPORATOR	0.153	0.828	7.110	0.388	0.000	2.570	2.858	1.350	2.142	7.797	4.000
GOBIOSOMA ROBUSTUM	125.700	100.917	45.095	5.255	2.087	25.213	21.510	18.200	138.945	148.000	36.343
MICROGOBIUS GULOSUS	362.567	12.407	5.645	0.817	0.000	3.700	2.285	0.430	0.300	0.705	2.915
PEPRILUS ALEPIDOTUS	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PRIONOTUS SP.	0.130	0.000	0.000	0.388	0.413	0.000	0.345	8.023	1.118	0.240	0.278
FAMILY TRIGLIDAE/SOLEIDAE	0.668	0.000	0.000	0.442	0.000	0.000	0.955	9.283	2.483	20.283	52.283
ACHIRUS LINEATUS	14.072	4.755	2.462	4.988	4.267	10.962	8.243	26.638	23.260	22.348	17.952
SYMPHURUS PLAGIUSA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.145	0.138	0.000	0.278
MONACANTHUS SP.	0.795	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.608	0.000	0.000
FAMILY OSTRACIIDAE	0.000	0.000	0.000	0.428	0.000	0.000	0.000	0.287	0.000	0.712	0.880
UNIDENTIFIED	16.572	0.698	5.405	3.777	2.075	8.078	4.328	38.463	64.058	90.555	38.348
UNIDENTIFIED-DAMAGED	14.750	4.117	14.680	15.212	3.955	0.808	28.787	16.427	3.883	13.070	12.170
PENAEUS SP.	2.453	1.100	0.368	0.000	0.435	0.387	0.792	0.000	0.000	1.595	1.410

TRACHYPENAEUS SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.602	0.240	0.000
CALLINECTES SP.	0.308	0.123	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.278
MENIPPE MERCENARIA	2418.14	74.567	533.003	615.572	671.627	246.888	362.245	1151.11	1144.65	161.388	2158.76
	2420.19										
TOTAL OF AVERAGE DENSITIES	3751.58	786.750	1171.52	1466.7	1103.07	2113.93	4573.09	2115.09	2511.91	2096.17	3737.72
	3753.64										

ENTRAINMENT

DENSITY BY STATION

NUMBER PER 100 CUBIC METERS

AUGUST 31, 1983

SPECIES NAME	STATION A	B	C	D	E	F	G	H	I	J	K
FAMILY CLUPEIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	51.833	78.343	1.883	0.000
CLUPEID	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	25.833	0.000	0.000
HARENGULA JAGUANA	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.205	0.000	0.000	0.203
OPHISTHONEMA OGLINUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	49.333	2.488	0.000	8.233
FAMILY ENGRAULIDAE	0.000	0.000	0.000	0.000	0.195	0.000	0.258	11.300	14.283	0.000	0.000
ANCHOA HEPSETUS	9.543	0.000	0.557	2.310	5.715	0.000	8.155	7.650	1.970	24.483	81.890
ANCHOA MITCHILLI	2096.92	195.747	290.305	746.198	1250.34	242.250	1193.14	170.358	1494.93	1191.77	2744
ANCHOA SP.	354.883	6.033	49.650	35.807	79.417	142.732	125.880	886.950	102.533	80.833	107.317
PORICHTHYS PLECTRODON	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.000	0.000	0.000
GOBIESOX STRUMOSUS	0.000	0.000	0.000	0.000	0.195	0.417	0.790	0.000	0.000	0.000	0.000
FAMILY EXOCOETIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.258	0.000	0.000	0.000	0.000
HYPORHAMPUS UNIFASCIATUS	0.127	0.000	0.000	0.000	0.000	0.353	0.753	0.557	0.172	0.188	0.397
FAMILY ATHERINIDAE	0.000	0.163	0.000	0.000	0.000	0.000	4.230	0.000	0.000	0.000	0.000
MEMBRAS MARTINICA	0.000	0.000	0.180	0.000	0.380	0.175	0.210	0.000	0.000	0.353	0.000
MENIDIA SP.	0.000	0.000	0.000	0.000	0.000	0.875	0.000	0.000	0.000	0.000	0.000
FAMILY SYNGNATHIDAE	0.000	0.000	0.000	0.000	0.000	0.332	0.000	0.000	0.000	0.000	0.000
HIPPOCAMPUS ERECTUS	0.000	0.000	0.000	0.000	0.000	0.165	0.467	0.173	0.372	0.183	0.203
HIPPOCAMPUS ZOSTERAE	0.000	0.000	0.000	0.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SYNGNATHUS FLORIDAE	0.750	0.163	0.000	0.000	0.000	0.188	0.630	0.000	1.282	0.557	1.915
SYNGNATHUS LOUISIANAE	0.285	0.000	0.000	0.000	0.000	0.457	0.585	0.000	1.235	0.000	0.730
SYNGNATHUS SCOVELLI	0.000	0.145	0.000	0.000	0.000	1.502	0.880	0.538	0.348	4.010	0.000
CHLOROSCOMBRUS CHRYSURUS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.172	0.000	0.000
OLIGOPLITES SAURUS	0.127	0.000	0.000	0.000	0.000	0.000	0.210	0.192	0.370	0.000	0.193
EUCINOSTOMUS SP.	0.000	0.292	0.000	0.000	0.000	0.175	0.160	0.000	0.177	0.000	0.000
FAMILY SCIAENIDAE	32.782	0.180	86.185	10.585	290.133	2.983	0.468	1208.98	39.517	154.067	302.255
BAIRDIELLA CHRYSOURA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.380
CYNOSCION ARENARIUS	0.527	0.000	0.000	0.000	0.000	0.000	0.000	0.552	0.000	0.000	0.170
CYNOSCION NEBULOSUS	1.402	0.145	0.000	0.000	0.[illegible]	[illegible]	[illegible]	15.[illegible]	27.047	12.995	17.258
MENTICIRRHUS SAXATILIS	0.000	0.000	0.000	0.[illegible]	0.219	0.000	[illegible]	0.828	0.180	0.202	0.185
MENTICIRRHUS SP.	2.290	0.000	0.000	[illegible]	0.[illegible]	0.[illegible]	0.418	9.778	2.157	1.632	3.165
CHAETODIPTERRUS FABER	0.213	0.000	0.000	0.000	[illegible]	0.188	0.000	0.552	1.298	0.000	0.767
PARACLINUS FASCIATUS	0.000	0.000	0.000	0.[illegible]	0.190	0.000	2.342	0.000	0.385	0.000	0.558
FAMILY BLENNIIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.[illegible]	0.000	0.715	10.860	9.93[illegible]
HYPSOBLENNIUS HENTZI	1.273	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UNIDENTIFIED BLENNY	3.085	2.530	5.058	11.592	11.302	21.[illegible]3	127.300	0.767	0.760	0.000	0.000
CALLIONYMUS PAUCIRADIATUS	0.[illegible]67	0.000	0.000	0.000	0.188	0.000	0.208	1.430	0.860	0.715	0.513
FAMILY GOBIIDAE	20.825	1.925	46.150	0.192	0.188	9.69[illegible]	[illegible]195	0.000	37.783	4.133	0.000
BATHYGOBIUS SOPORATOR	0.752	0.000	0.660	0.000	0.000	0.340	[illegible]298	1.462	6.350	0.188	3.982
GOBIOSOMA ROBUSTUM	34.897	2.742	53.215	14.017	10.645	30.562	7.547	55.868	92.717	31.250	66.493
MICROGOBIUS GULOSUS	2.835	2.965	3.247	4.065	3.145	39.103	31.558	0.000	0.000	0.377	0.170
PRIONOTUS SP.	0.130	0.000	0.000	0.000	0.000	0.000	0.000	2.215	2.797	0.555	1.737
FAMILY TRIGLIDAE/SOLEIDAE	7.300	0.202	5.858	0.407	0.000	0.398	0.258	14.867	2.087	3.250	17.283
ACHIRUS LINEATUS	6.715	1.130	4.390	5.047	2.718	5.360	5.653	7.020	20.505	6.100	8.978
SYMPHURUS PLAGIUSA	0.127	0.000	0.000	0.000	0.000	0.000	0.000	0.173	0.172	0.000	0.000
MONACANTHUS SP.	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.365	0.702	0.000	0.377
FAMILY OSTRACIIDAE	0.000	0.000	0.000	0.000	0.197	0.340	0.160	0.205	0.172	0.697	1.195

SPHOEROIDES SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.180	0.405	0.000	
CHILOMYCTERUS SCHOEPFI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.170	0.000	0.000	
UNIDENTIFIED	1.603	4.423	5.993	2.127	3.645	12.778	5.167	38.735	82.697	24.223	110.357	
UNIDENTIFIED-DAMAGED	8.507	24.105	2.293	0.558	0.775	0.000	4.222	0.615	16.423	0.000	1.227	
PENAEUS SP.	3.325	5.052	0.550	0.000	0.178	1.517	4.272	0.693	2.553	0.937	43.853	0.740
TRACHYPENAEUS SP.	0.535	0.000	0.000	0.000	0.000	0.568	0.165	5.507	0.510	0.000	0.000	
CALLINECTES SP.	0.000	0.000	0.000	0.000	0.000	0.353	0.000	0.000	0.000	0.000	0.363	
MENIPPE MERCENARIA	1270.98	10.323	210.362	370.940	339.200	361.038	860.743	2247.2	1004.71	73.553	2632.03	2666.03
LOLLIGUNCULA BREVIS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.177	0.000	0.000	
TOTAL OF AVERAGE DENSITIES	3863.41	258.265	764.653	1204.23	1999.53	878.075	2388.01	4792.38	3068.13	1630.4	3168.31	6159.20

ENTRAINMENT

DENSITY BY STATION

NUMBER PER 100 CUBIC METERS

AUGUST 31, 1983

SPECIES NAME	STATION L	M	N	P
	7.645			
ANCHOA MITCHILLI	8.490	2.735	0.000	0.000
ANCHOA SP.	0.000	1.177	0.497	0.000
HYPORHAMPUS UNIFASCIATUS	0.000	0.417	0.000	0.000
CYPRINODON VARIEGATUS	0.000	0.000	1.822	0.000
LUCANIA PARVA	0.000	0.322	0.000	1.897
HIPPOCAMPUS ZOSTERAE	0.000	0.597	0.000	0.000
SYNGNATHUS FLORIDAE	0.000	0.000	0.000	0.585
SYNGNATHUS SCOVELLI	0.000	0.605	0.000	0.393
CHLOROSCOMBRUS CHRYSURUS	0.468	0.000	0.000	0.000
EUCINOSTOMUS SP.	0.000	1.842	6.195	36.700
CYNOSCION NEBULOSUS	0.422	0.605	0.000	0.000
FAMILY BLENNIIDAE	1.300	2.725	15.532	9.997
BATHYGOBIUS SOPORATOR	0.000	0.000	0.523	0.000
GOBIOSOMA ROBUSTUM	13.595	46.467	6.248	23.050
MICROGOBIUS GULOSUS	3.262	9.883	9.130	2.098
ACHIRUS LINEATUS	0.000	1.065	0.922	1.892
UNIDENTIFIED	0.000	0.643	0.000	0.000
UNIDENTIFIED-DAMAGED	0.422	0.000	0.000	0.393
PENAEUS SP.	0.958	0.000	0.000	0.000
CALLINECTES SP.	0.000	0.000	2.383	1.767
MENIPPE MERCENARIA	0.422	0.000	0.408	0.000
TOTAL OF AVERAGE DENSITIES	29.338	69.082	43.660	78.772
	28.493			

ENTRAINMENT

DENSITY BY STATION

NUMBER PER 100 CUBIC METERS

SEPTEMBER 14, 1983

SPECIES NAME	STATION A	B	C	D	E	F	G	H	I	J	K
				106.687							
FAMILY CLUPEIDAE	0.000	0.000	0.000	0.000	0.000	0.175	0.000	0.000	0.000	0.000	0.220
BREVOORTIA SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.207	0.000	0.000	0.000
HARENGULA JAGUANA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.232	0.000	0.000
OPHISTHONEMA OGLINUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.217	0.000	0.168	0.000
FAMILY ENGRAULIDAE	0.000	0.000	0.187	0.000	0.538	0.000	0.000	42.567	11.678	0.000	13.533
ANCHOA HEPSETUS	0.000	0.000	0.000	0.238	0.268	0.000	1.128	0.000	4.650	1.240	0.880
ANCHOA MITCHILLI	28.294 627.442	22.658	27.247	96.820	171.568	56.363	125.808	367.877	294.093	309.862	247.425 232.425
ANCHOA SP.	1.856 140.033	0.360	1.813	12.885	17.340	4.850	1.512	3.483	1.000	1.807	4.567
GOBIESOX STRUMOSUS	0.280	0.000	0.000	0.808	0.000	0.200	0.000	0.000	0.000	0.373	0.000
HYPORHAMPUS UNIFASCIATUS	1.142	0.000	0.187	1.065	1.053	0.000	0.280	0.000	0.543	1.225	0.220
MEMBRAS MARTINICA	0.000	0.180	0.000	0.000	0.268	0.000	0.172	0.000	0.000	0.245	0.000
MENIDIA SP.	0.000	0.000	0.000	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000
HIPPOCAMPUS ERECTUS	1.282	0.000	0.000	0.000	0.538	0.175	0.000	1.083	1.937	0.168	0.000
HIPPOCAMPUS ZOSTERAE	0.000	0.000	0.000	0.000	0.270	0.175	0.390	0.000	0.000	0.000	0.000
MICROGNATHUS CRINIGER	0.000	0.000	0.000	0.000	0.000	0.175	0.000	0.000	0.000	0.158	0.208
SYNGNATHUS FLORIDAE	0.507	0.000	0.000	0.000	1.093	0.175	0.310	3.767	4.565	1.763	4.565
SYNGNATHUS LOUISIANAE	2.482	0.000	0.000	0.000	0.000	1.102	0.280	1.932	0.225	0.223	0.645
SYNGNATHUS SCOVELLI	0.000	0.000	0.000	0.000	0.222	0.000	0.900	1.308	1.118	0.452	1.380
RACHYCENTRON CANADUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.180	0.000	0.000
OLIGOPLITES SAURUS	0.000	0.000	0.000	0.303	0.000	0.000	0.197	0.000	0.338	0.000	0.000
EUCINOSTOMUS SP.	0.000	0.455	0.000	0.000	0.000	0.000	0.197	0.000	0.232	0.000	0.000
FAMILY SCIAENIDAE	39.185	0.000	39.353	103.333	36.988	0.000	7.980	233.583	10.943	40.323	47.270
CYNOSCION NEBULOSUS	1.117	0.000	0.000	0.000	1.902	0.000	0.000	0.000	0.555	0.000	0.683
MENTICIRRHUS SP.	1.533	0.000	0.000	0.267	0.270	0.000	0.000	0.000	0.000	0.000	0.937
CHAETODIPTERRUS FABER	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.235
PARACLINUS FASCIATUS	0.280	0.000	0.000	0.000	0.538	0.000	0.000	0.442	0.922	0.000	0.748
FAMILY BLENNIIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.670	11.160
UNIDENTIFIED BLENNY	27.525	4.435	0.000	7.537	19.343	1.460	2.025	2.378	6.087	0.505	0.000
CALLIONYMUS PAUCIRADIATUS	2.187	0.180	0.252	0.238	0.000	0.350	0.000	0.632	4.515	0.000	1.845
FAMILY GOBIIDAE	0.210 11.945	0.000	0.167	0.460	19.885	33.547	2.890	33.217	3.802	0.000	0.000
BATHYGOBIUS SOPORATOR	4.872	0.000	0.000	0.000	1.093	0.000	0.000	6.113	1.520	0.395	3.763
GOBIOSOMA ROBUSTUM	80.780	5.112	30.222	3.893	8.067	74.627	4.420	9.950	51.013	29.493	58.788
MICROGOBIUS GULOSUS	30.352 4.148	15.508	1.782	0.303	0.285	19.138	9.707	0.000	0.000	0.000	0.918
PRIONOTUS SP.	2.920 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.070
FAMILY TRIGLIDAE/SOLEIDAE	8.533	0.000	0.627	0.238	5.517	0.677	2.083	3.465	2.845	11.083	3.517
ACHIRUS LINEATUS	0.887	0.275	0.462	2.852	8.140	1.127	0.000	2.238	1.753	3.133	2.807
SYMPHURUS PLAGIUSA	0.000	0.473	0.000	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MONACANTHUS CILIATUS	0.000	0.000	0.000	0.000	0.000	0.173	0.000	0.000	0.000	0.000	0.000
MONACANTHUS SP.	0.512	0.000	0.000	0.000	0.268	0.200	0.310	0.207	0.232	0.000	0.187
FAMILY OSTRACIIDAE	0.000	0.000	0.000	0.000	0.840	0.000	0.000	0.000	0.000	0.000	0.375
SPHOEROIDES SP.	0.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHILOMYCTERUS SCHOEPFI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.217	0.000	0.000	0.000
UNIDENTIFIED	3.138	0.000	0.738	0.238	2.000	1.008	1.368	26.998	29.008	13.968	11.330
UNIDENTIFIED-DAMAGED	5.393	0.000	0.167	0.505	3.807	0.378	0.930	0.640	0.180	1.100	0.615
PENAEUS SP.	0.655	6.270	4.735	5.353	11.672	0.000	26.165	1.093	0.000	1.332	1.385
TRACHYPENAEUS SP.	0.315	0.882	0.000	0.000	0.000	0.200	0.280	0.217	0.225	0.000	0.000

30.775 4239.05

CALLINECTES SP.	0.000	1.578	1.[illegible]	0.238	3.465	1.383	0.788	0.808	0.225	0.395	0.440
MENIPPE MERCENARIA	2117.35	25.310	30.126	451.633	562.722	420.768	168.097	4239.12	1904.5	114.705	3584.77
LOLLIGUNCULA BREVIS	0.000	0.000	0.252	0.000	0.000	0.000	0.280	0.000	0.000	0.000	1.358
TOTAL OF AVERAGE DENSITIES	3083.8	83.677	139.358	689.673	879.962	618.427	358.497	4983.75	2339.12	539.788	4008.84
			141.268	702.157				4983.68			3993.84

10

ENTRAINMENT

DENSITY BY STATION

NUMBER PER 100 CUBIC METERS

SEPTEMBER 27, 1983

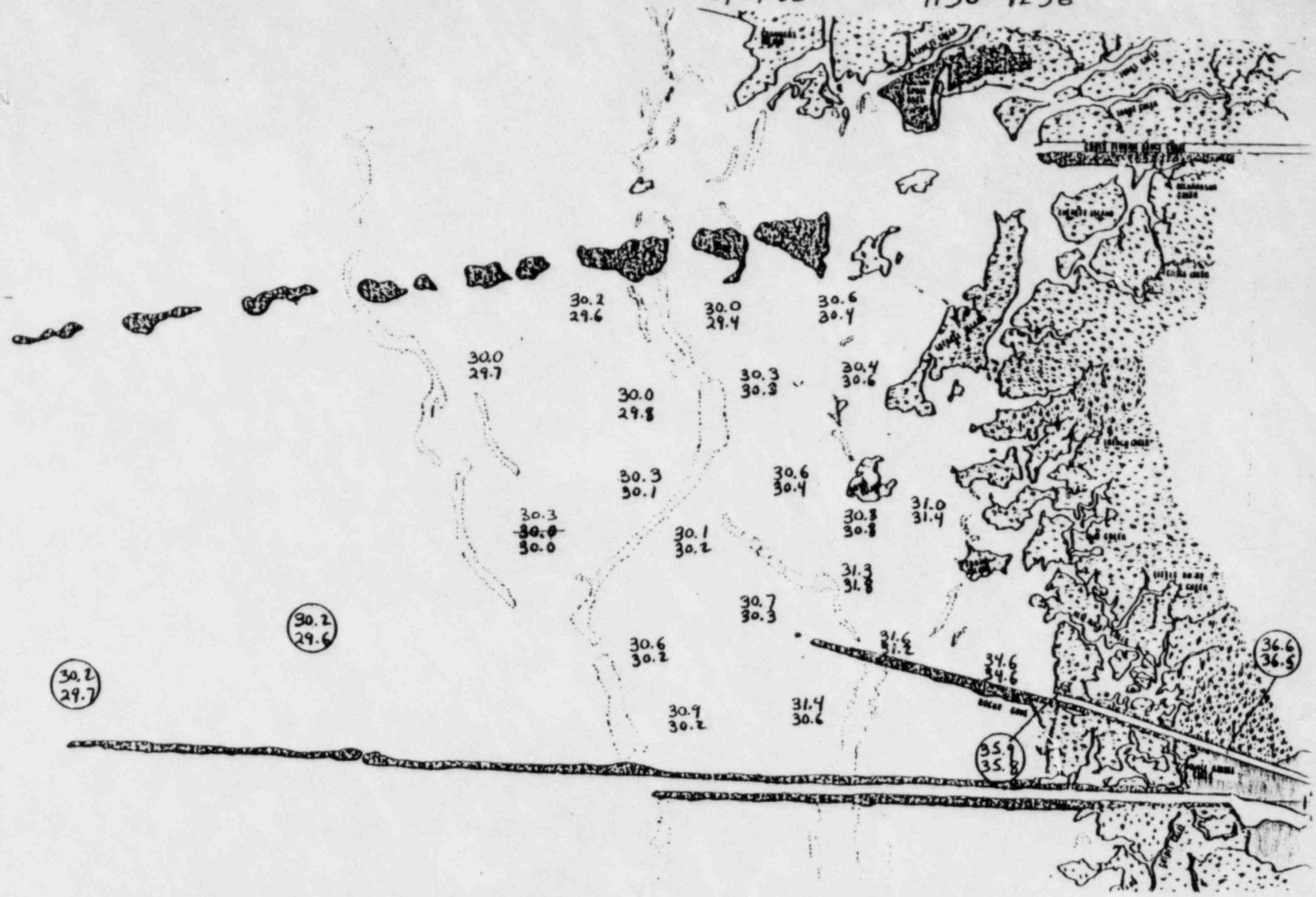
SPECIES NAME	STATION A	B	C	D	E	F	G	H	I	J	K
CLUPEID	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.523	0.000	0.000	0.000
BREVOORTIA SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.925	0.645	0.000	0.000
FAMILY ENGRAULIDAE	0.297	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.315	0.000
ANCHOA HEPSETUS	0.000	0.000	0.000	0.000	0.000	0.513	0.250	0.000	0.000	7.465	8.725
ANCHOA MITCHILLI	2.083	137.517	52.108	8.488	7.473	29.990	32.677	12.133	118.045	17.368	19.133
ANCHOA SP.	1.310	7.198	62.427	4.720	5.278	17.267	15.580	0.217	0.323	46.910	41.907
GOBIESOX STRUMOSUS	0.000	0.230	0.228	0.482	0.468	0.257	0.167	0.000	0.307	0.000	0.760
HIPPOCAMPUS ERECTUS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.245	0.303	0.203	0.000
HIPPOCAMPUS ZOSTERAE	0.000	0.000	0.000	0.000	0.228	0.000	0.000	0.000	0.000	0.000	0.000
MICROGNATHUS CRINIGER	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.315	0.000
SYNGNATHUS FLORIDAE	0.000	0.230	0.000	0.302	1.370	0.237	2.625	0.643	1.617	5.082	1.433
SYNGNATHUS LOUISIANAE	0.000	0.000	0.267	0.000	0.000	0.000	0.000	0.245	1.402	0.000	0.000
SYNGNATHUS SCOVELLI	0.000	0.000	0.000	0.000	0.000	0.000	2.707	0.247	0.000	0.000	1.908
CHLOROSCOMBRUS CHRYSURUS	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000
FAMILY SCIAENIDAE	2.430	0.000	0.000	0.000	0.000	0.000	0.365	3.153	1.740	0.000	3.823
CYNOSCION NEBULOSUS	0.000	0.000	0.000	0.282	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MENTICIRRHUS SAXATILIS	0.000	0.000	0.257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FAMILY BLENNIIDAE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.468	0.768
UNIDENTIFIED BLENNY	0.225	0.965	0.743	0.000	1.662	0.750	3.115	0.000	0.630	3.128	0.990
CALLIONYMUS PAUCIRADIATUS	0.000	0.000	0.223	0.000	0.000	0.000	0.000	0.247	0.000	0.000	0.203
FAMILY GOBIIDAE	0.000	3.995	0.000	0.302	0.235	3.082	0.332	0.495	4.400	16.880	0.247
BATHYGOBIUS SOPORATOR	0.000	0.248	0.712	0.000	0.228	0.000	0.000	0.000	0.307	1.063	1.617
GOBIOSOMA ROBUSTUM	1.555	5.088	24.687	2.768	4.618	9.733	14.587	1.793	1.362	57.835	63.792
MICROGOBIUS GULOSUS	0.000	3.953	3.638	0.000	0.000	3.978	1.883	0.000	0.000	0.000	0.000
PRIONOTUS SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.443
FAMILY BOTHIDAE/SOLEIDAE	0.297	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ACHIRUS LINEATUS	0.893	0.000	0.745	0.533	0.240	0.630	0.083	1.887	2.490	1.247	0.585
MONACANTHUS SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.365	0.000	0.000	0.000	0.000
SPHOEROIDES SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.332	0.000	0.215	0.000	0.000
UNIDENTIFIED	0.297	0.000	0.000	0.000	0.480	0.317	1.428	7.155	14.082	2.625	4.960
UNIDENTIFIED-DAMAGED	0.000	0.000	0.000	0.000	0.292	0.313	0.332	2.783	1.823	1.367	1.203
PENAEUS SP.	0.000	0.488	0.000	0.000	0.000	0.000	0.167	0.000	0.000	0.203	0.000
TRACHYPENAEUS SP.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.203	0.000
CALLINECTES SP.	0.225	2.023	2.693	9.063	13.683	2.480	0.998	0.247	1.507	5.367	0.495
MENIPPE MERCENARIA	122.467	13.445	113.283	145.613	240.165	49.220	287.958	63.105	535.640	504.087	2398.63
LOLLIGUNCULA BREVIS	0.000	0.000	0.258	0.000	0.000	0.000	0.083	0.000	0.215	0.000	0.000
TOTAL OF AVERAGE DENSITIES	132.078	175.382	262.270	172.553	276.422	118.767	366.117	98.043	687.052	672.132	2551.62

104.545

673.552

Survey #1 Temperatures (°C) HWS (1)

8/6/83 1136-1236



Temperatures (°C) LWS (1)

8/6/83 1953 - 2053

+ no. shade in the field. log

* No. is correct based on field log, however a ± 5° reading error could exist in one measurement the bottom value than becomes 31.7

Temperatures(°C) LWS (‰)

8/7/83 0734-0834

(7)

Temperatures (°C) Flood (2)

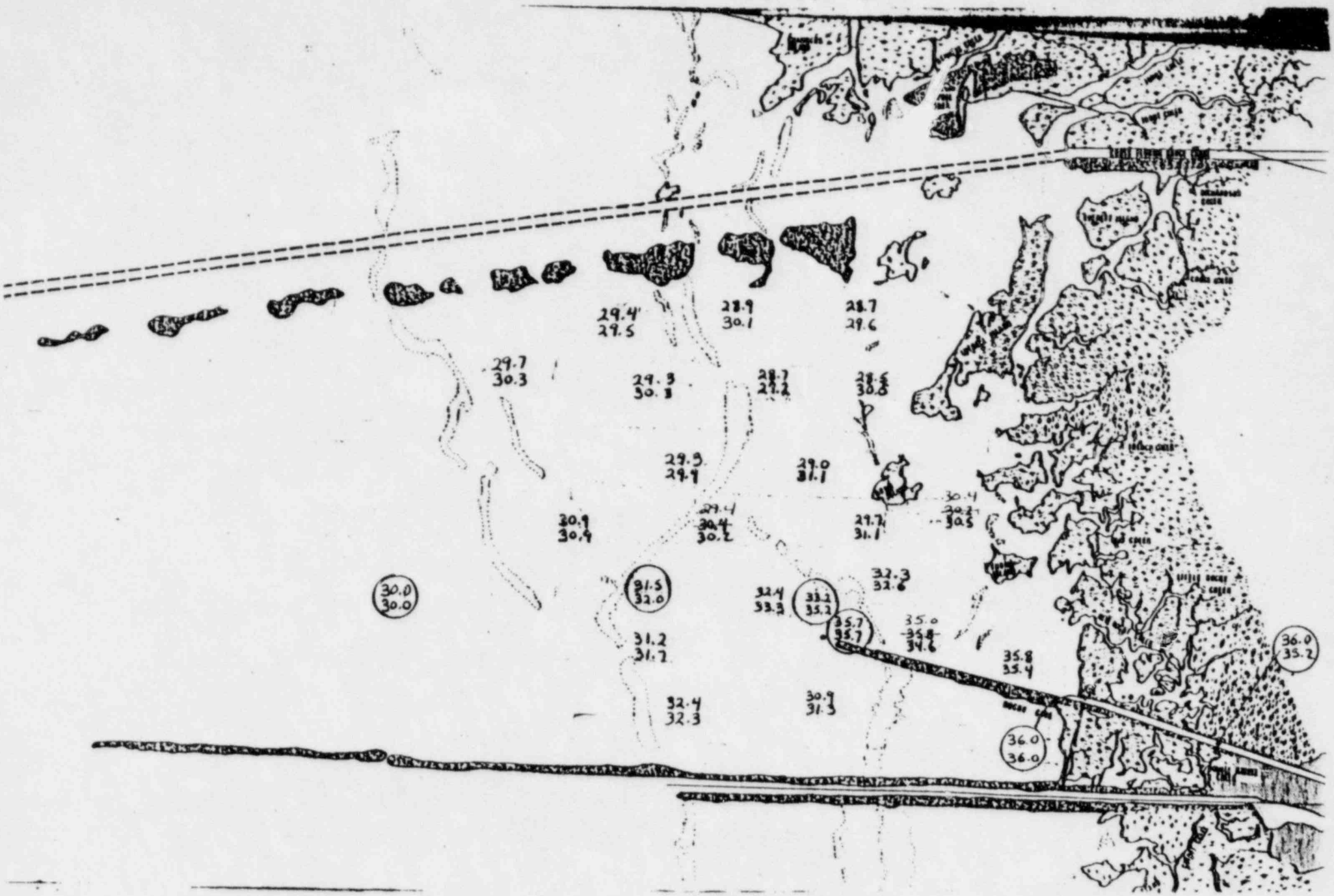
8/7/83 1003 - 1103

Temperatures (°C) HWS(3) (9)

8/7/83 1230 - 1330

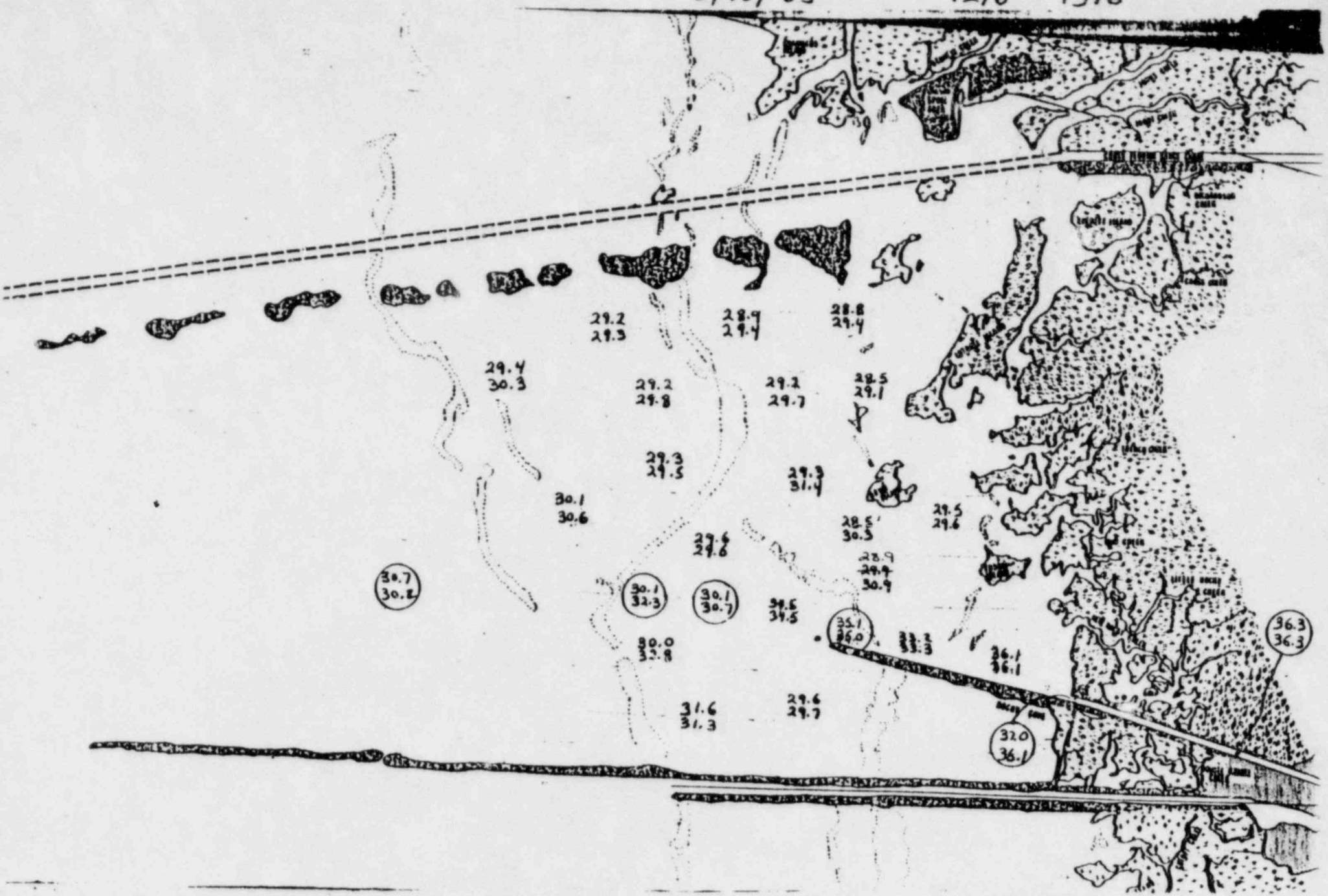
Survey #2 Temperatures (°C) Ebb (1)

8/13/83 0846-0946



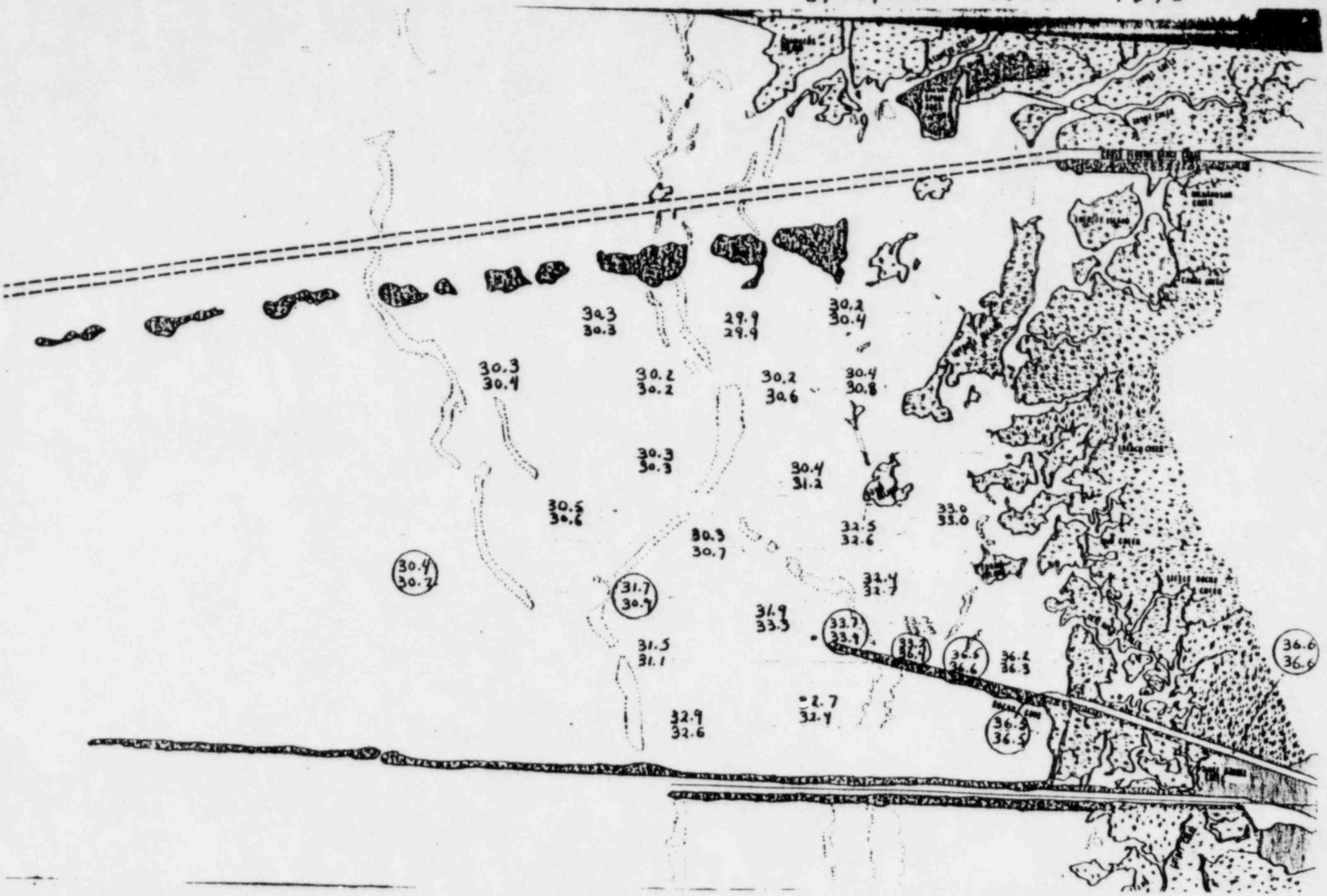
Temperatures (°C) LWS

8/13/83 1216 - 1316



Temperatures (°C) HWS

8/13/83 1740 - 1840



TEMPERATURES (°C)

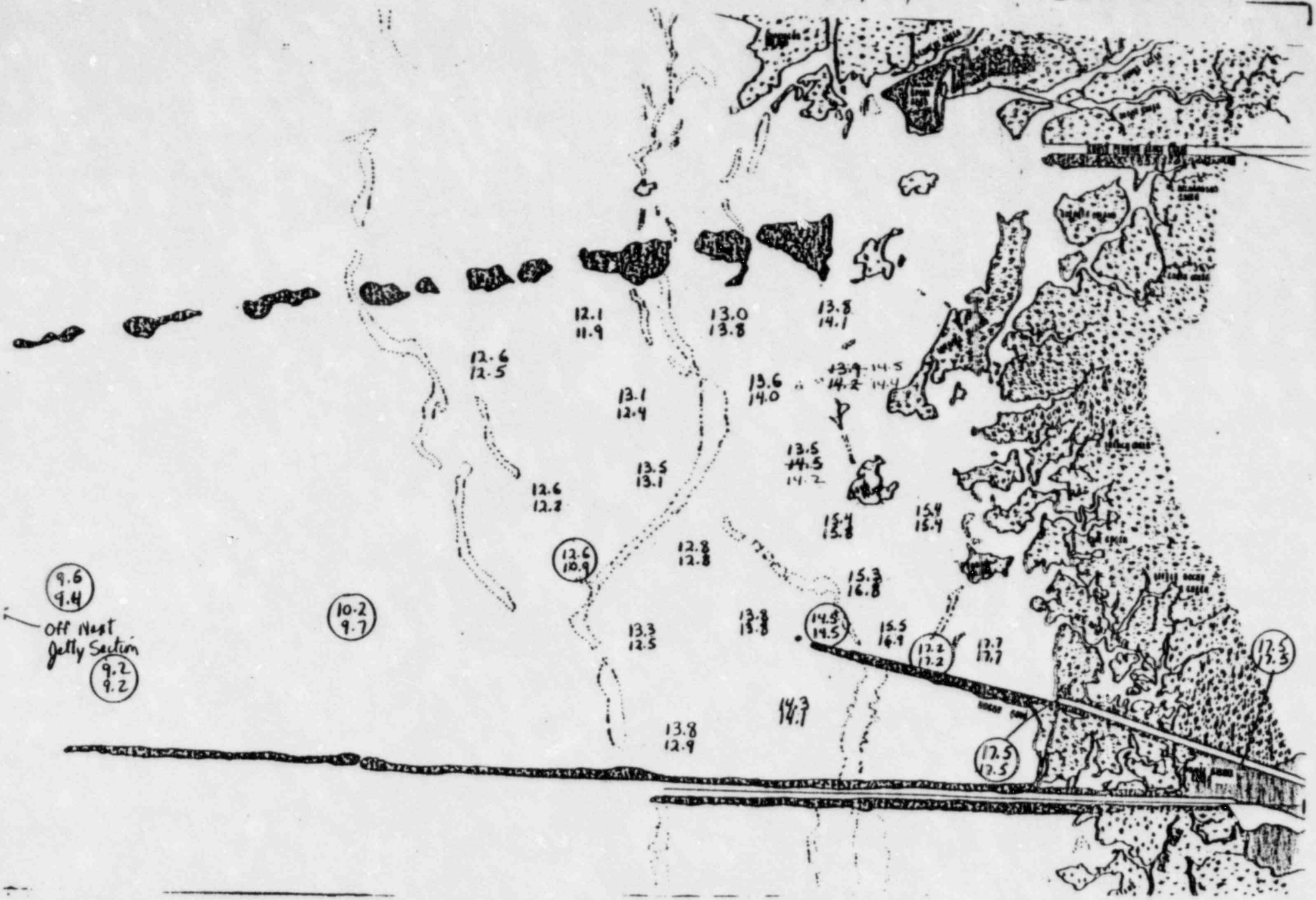
1/6/84

FLOOD (1)

1300 – 1400

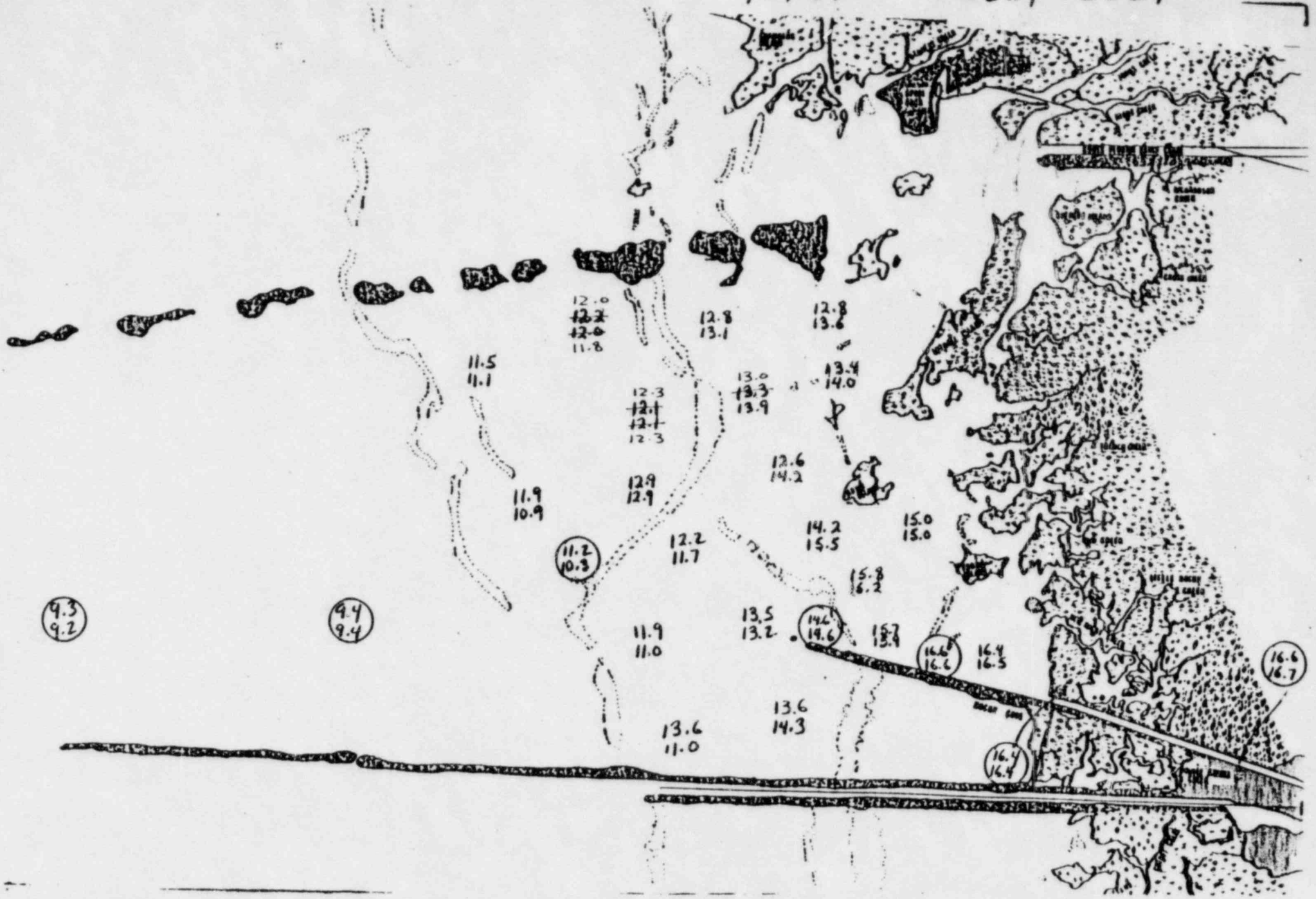
Temperatures (°C) HWS (1) (3)

1/6/84 1555-1655



Temperatures (°C) HWS(2) (7)

1/7/84 0254 - 0354



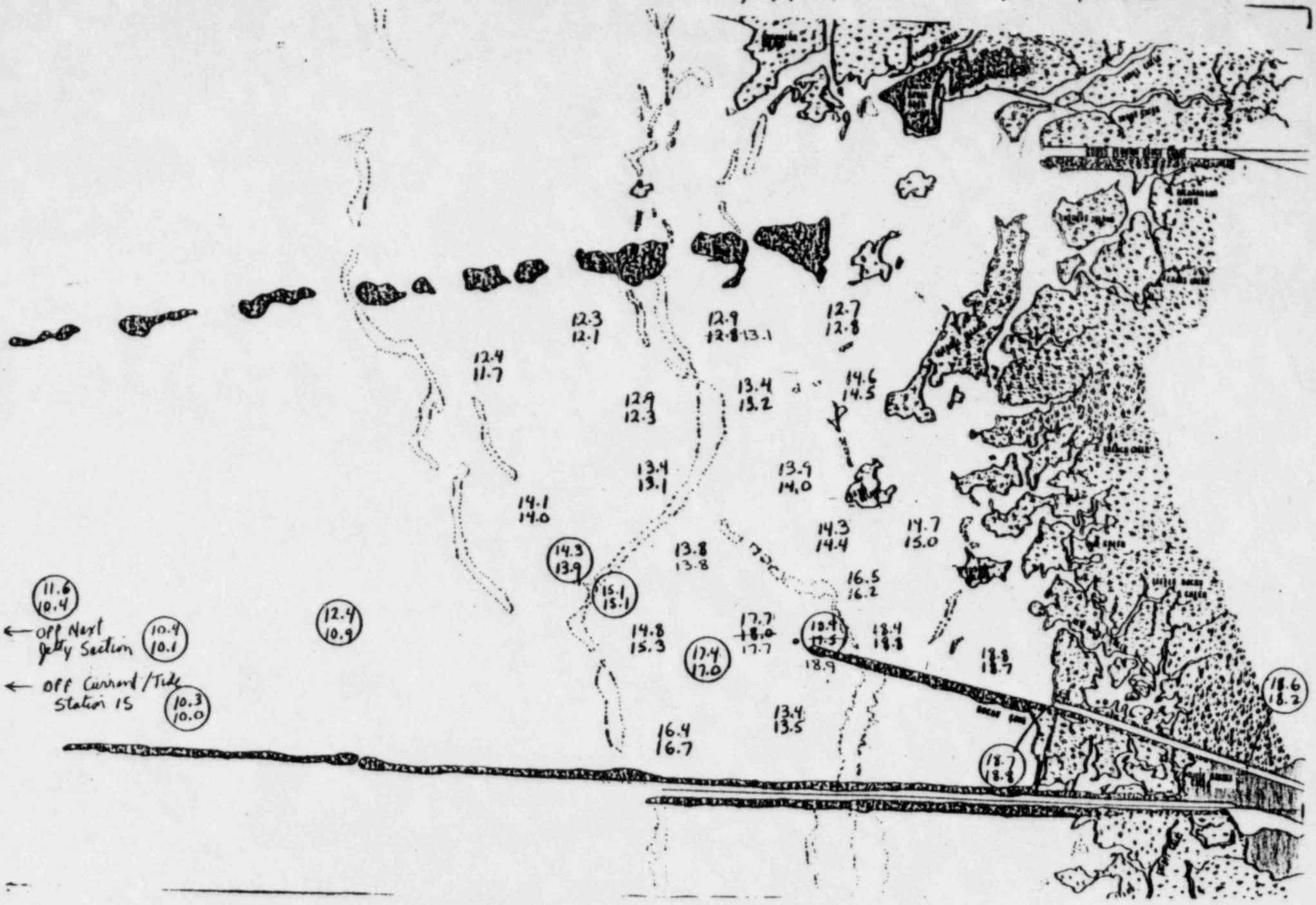
SURVEY #4

Temperatures (°C) Ebb (1)

1/9/84 0808 - 0908

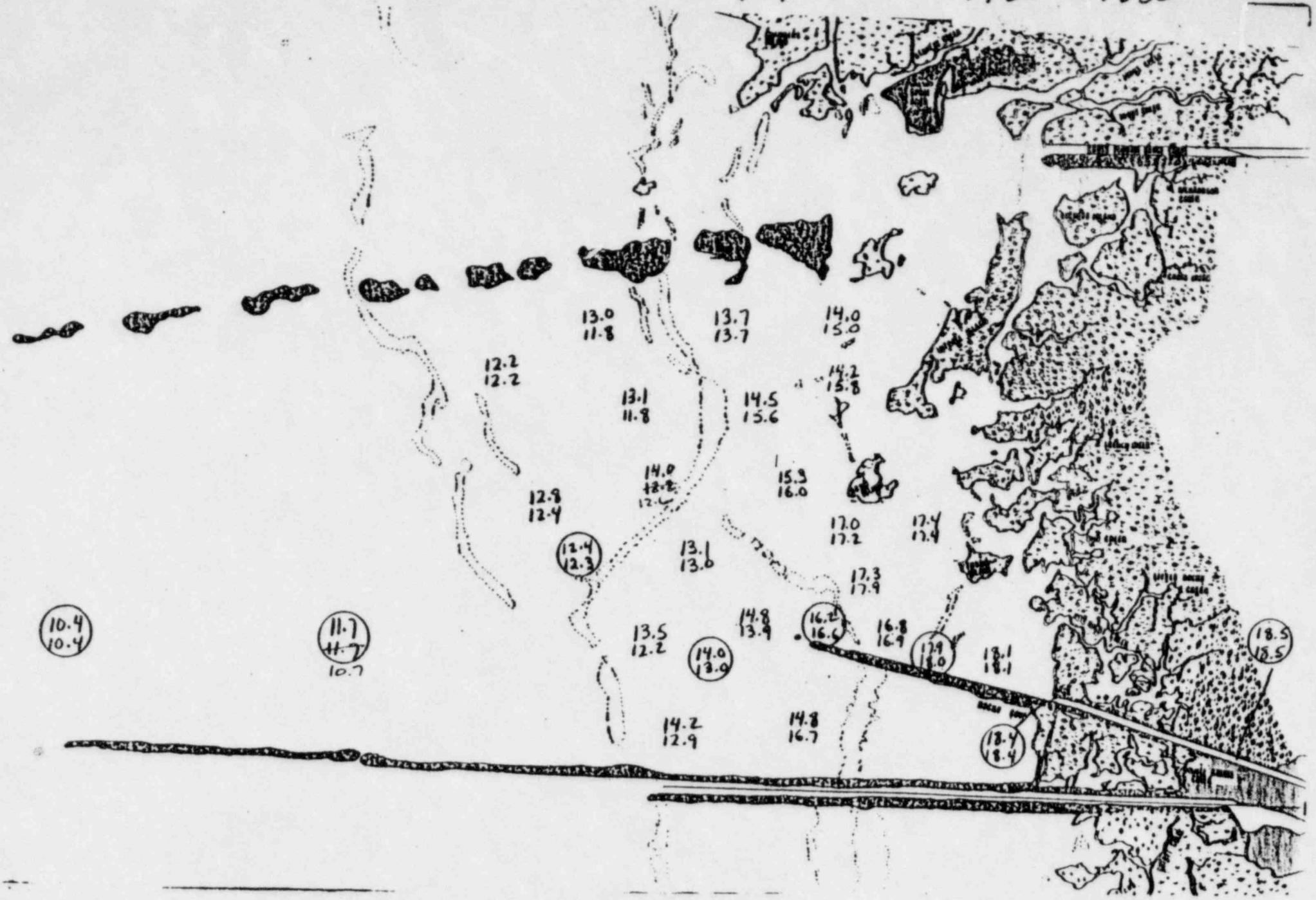
Temperatures (°C) LWS ②

1/9/84 1146 - 1246



Temperatures (°C) HWS (4)

1/9/84 1730 - 1830



Florida Power
CORPORATION

June 7, 1984

Mr. Paul J. Traina
Water Management Division
United States Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Traina,

Enclosed is a copy of the Notes of Conference from the Third Quarterly Progress Meeting for the Crystal River 316 Study held in St. Petersburg on May 3, 1984.

During the Quarterly Meeting, it was noted that several corrections to the data tables in the Third Quarterly Report were needed, and it was requested that marked tables be provided. Pursuant to that request, copies of the following corrected tables are enclosed:

- Revised tables of June temperature and conductivity. These tables have been changed to reflect a 90 minute, rather than a 2 hour, tide window and to correct incorrectly specified times for maximum tide.
- July, 1984, temperatures by week.
- Juncus marsh data for October, 1983.
- Entrainment densities for July 21, August 31 (2), September 14, and September 27.
- Fourteen figures showing temperatures monitored in August and January. Also, please note that a few uncircled temperatures have been found to represent single readings in contrast to the absolute statement on Page 4-1 of the Quarterly Report, however, they remain uncircled to distinguish the readings from ones taken by the "chase" boat.

Figures showing salinity data for the intensive surveys will be checked during the next several weeks since changes in temperature are reflected in the conductivity to salinity conversion. Any needed corrections will be forwarded.

If you have any questions concerning the enclosed items, please contact Mr. Paul Behrens in St. Petersburg at 813/866-5521.

Sincerely,

FLORIDA POWER CORPORATION

William S O'Brien

William S. O'Brien
Director
Environmental & Licensing Affairs

WSO/taf

Enclosures

cc: Mr. C. H. Kaplan, EPA
Mr. D. Hicks, EPA
Mr. J. P. Subramani, FDER
Dr. L. A. Olsen, FDER
Dr. D. Farrell, FDER
Mr. J. W. Pulliam, FWS, w/o enclosure
Mr. J. R. Carroll, FWS
Mr. J. T. Brawner, NMFS, w/o enclosure
Dr. E. Keppner, NMFS