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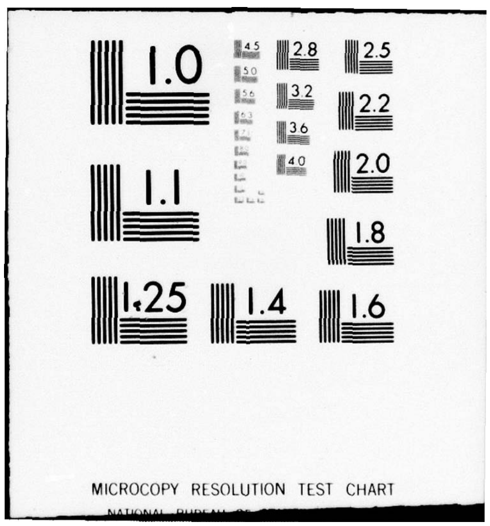
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TECHNICAL REPORT HL-79-12

MAYPORT-MILL COVE MODEL STUDY

Report 1

HYDRAULIC, SALINITY, AND SHOALING VERIFICATION

Hydraulic Model Investigation

by

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July 1979
Report 1 of a Series

Approved For Public Release; Distribution Unlimited

Prepared for U. S. Army Engineer District, Jacksonville
Jacksonville, Florida 32201

MAYPORT-MILL COVE MODEL STUDY REPORTS

Report No.	Title	Publication Date or Status
1	Hydraulic, Salinity, and Shoaling Verification	July 1979
2	Mayport Naval Basin Study	In Preparation
3	Mill Cove Study	In Preparation

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER
Technical Report HL-79-12

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)
MAYPORT-MILL COVE MODEL STUDY, Report 1, HYDRAULIC, SALINITY, AND SHOALING VERIFICATION; Hydraulic Model Investigation

5. TYPE OF REPORT & PERIOD COVERED
Report 1 of a series

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
Noble J. Brogdon, Jr.

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS
U. S. Army Engineer Waterways Experiment Station
Hydraulics Laboratory
P. O. Box 631, Vicksburg, Miss. 39180

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
226p.

11. CONTROLLING OFFICE NAME AND ADDRESS
U. S. Army Engineer District, Jacksonville
P. O. Box 4970
Jacksonville, Fla. 32201

12. REPORT DATE
July 1979

13. NUMBER OF PAGES
222

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
WES-TR-HL-79-12

15. SECURITY CLASS. (of this report)
Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Fixed-bed models
Hydraulic models
Mayport-Mill Cover
Model verification
Prototype confirmation
Salinity
Shoaling materials (Models)
Tidal models

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A fixed-bed model of Mayport-Mill Cove, constructed to scales of 1:500 horizontally and 1:50 vertically, reproduced a portion of the Atlantic Ocean adjacent to the entrance and the St. Johns River upstream to Hibernia Point. The purpose of the model study was twofold: (a) to investigate the effects of proposed improvement plans for the Mayport Naval Basin area on existing shoaling rates, hydraulics, salinities, and flushing; and (b) to
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Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

038 100

20. ABSTRACT (Continued)

investigate the effects of proposed improvement plans in the Mill Cove area on flushing, hydraulics, salinities, and channel shoaling. The model study was conducted in three phases: phase 1 involved the model verification tests, phase 2 involved the Mayport Naval Basin Study, and phase 3 involved the Mill Cove study. Phase 1 is reported herein; phases 2 and 3 will be reported in Reports 2 and 3 of this series.

The model verification tests described herein indicated that the model hydraulic and salinity regimes were in satisfactory agreement with those of the prototype for comparable conditions. Model verification also included a comprehensive shoaling verification of shoaling rates and patterns in the navigation channel and Mayport Naval Basin. During the shoaling verification, model operation procedures were developed by trial and error to achieve satisfactory reproduction of observed prototype shoaling distribution patterns within the various reaches of the navigation channel and in Mayport Basin. This report contains the results of tests conducted for phase 1 of the study.

PREFACE

The model study reported herein was requested by the U. S. Army Engineer Division, South Atlantic, in a letter to the Office, Chief of Engineers, U. S. Army, dated 14 April 1973, and was subsequently approved in a letter to the South Atlantic Division, dated 5 November 1973. Authority to initiate the investigation was granted by the U. S. Army Engineer District, Jacksonville, in a letter to the Director, U. S. Army Engineer Waterways Experiment Station (WES), dated February 1974.

Design and construction of the model were accomplished during the period of February 1974 to November 1975; hydraulic and salinity verification were carried out during the period December 1975-June 1976. Collection of base test data, navigation channel and Mayport Basin shoaling verification, was accomplished during the period July 1976-February 1977. After completion of all phases of model verification and base tests, the Mayport Basin study phase of the investigation was initiated. All programmed plan testing (Mayport Basin and Mill Cove Study Phases) was completed in August 1978. This report describes the problems that necessitated the model investigation, the model and its appurtenances, and verification.

The study was conducted in the Hydraulics Laboratory of WES under the general supervision of Messers. H. B. Simmons, Chief of the Hydraulics Laboratory; F. A. Herrmann, Jr., Assistant Chief of the Hydraulics Laboratory; R. A. Sager, Chief of the Estuaries Division; G. M. Fisackerly, Chief of the Harbor Entrance Branch; and N. J. Brogdon, Jr., Project Engineer. Technicians of the Estuaries Division who assisted throughout the investigation included Messers. J. W. Parman, D. M. White, and D. M. Stewart. This report was prepared by Mr. Brogdon.

Directors of WES during the course of this investigation and the preparation and publication of this report were COL G. H. Hilt, CE, COL John L. Cannon, CE, and COL Nelson P. Conover, CE. Technical Director was Mr. F. R. Brown.

CONTENTS

CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI) UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
cubic feet per second	0.02831685	cubic metres per second
cubic yards	0.7645549	cubic metres
feet	0.3048	metres
feet per second	0.3048	metres per second
inches	25.4	millimetres
miles (U. S. statute)	1.609344	kilometres
square feet	0.09290304	square metres
square miles (U. S. statute)	2.589988	square kilometres

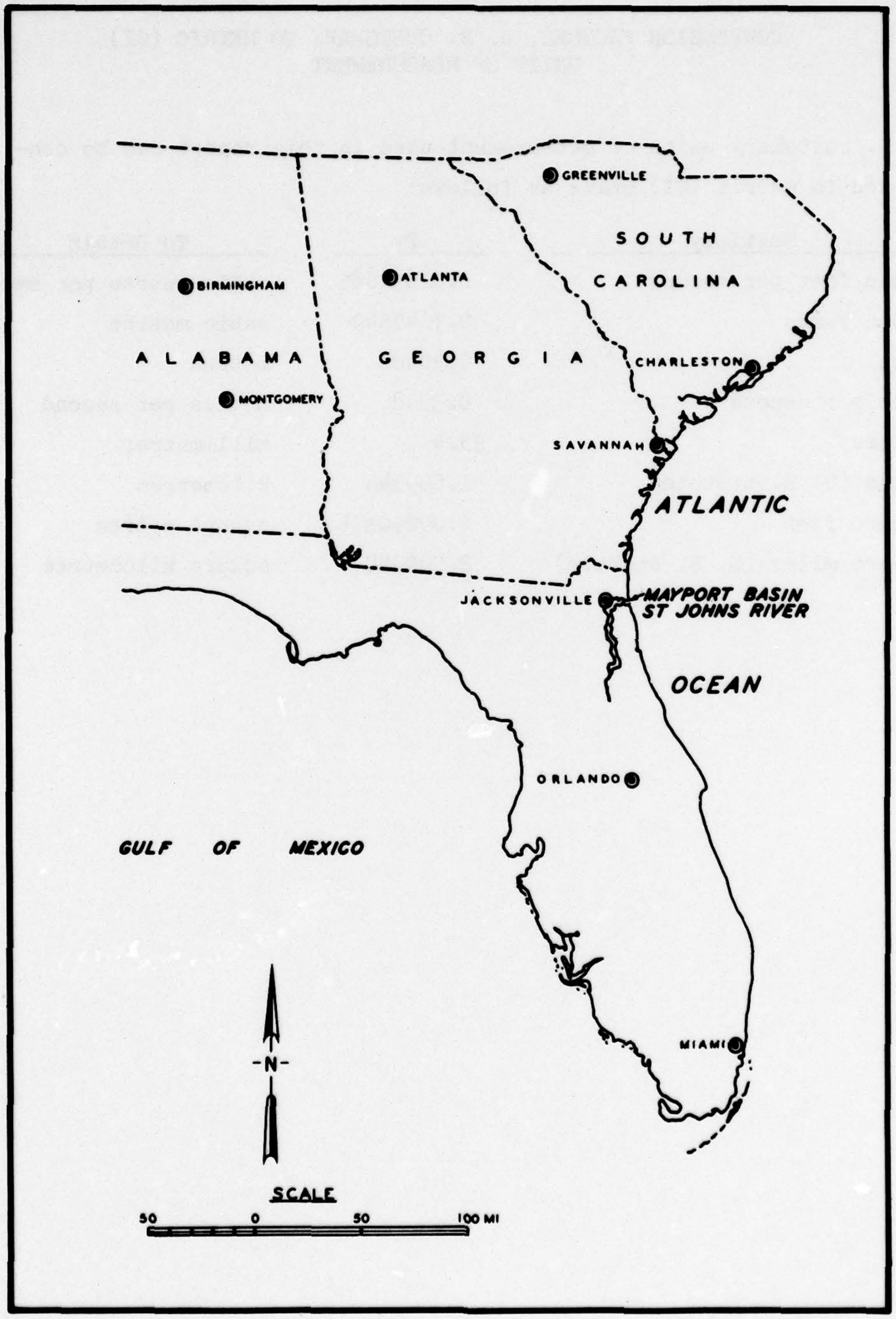

Figure 1. Location map

MAYPORT-MILL COVE MODEL STUDY

HYDRAULIC, SALINITY, AND SHOALING VERIFICATION

Hydraulic Model Investigation

PART I: INTRODUCTION

Background

1. This model study was a joint effort by the Department of the Navy and the U. S. Army Engineer District, Jacksonville, to study two separate problem areas on the St. Johns River. The first study (Report 2) was conducted for the Department of the Navy in an effort to help develop and investigate plans that would reduce shoaling in the Mayport Basin. The second study (Report 3) was conducted for the Jacksonville District to develop and test plans that would improve flushing in Mill Cove and reduce the silting rate.

Objective

2. The accurate reproduction of hydraulic, salinity, and shoaling phenomena in an estuary model is an essential phase in the preparation of the model for its ultimate use in evaluating the effects of proposed improvement works. This report describes the hydraulic, salinity, and shoaling verification of the model.

Prototype

3. The St. Johns River entrance (Figure 1) located in northeast Florida is about 125 miles* south of Savannah Harbor, Georgia. The St. Johns River rises in Brevard County in east-central Florida, flows

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* A table of factors for converting U. S. customary units of measurement to metric (SI) units is presented on page 3.

northerly 257 miles to Jacksonville and thence easterly about 26 miles to the Atlantic Ocean, a total distance of approximately 283 miles. The watershed is about 40 miles wide and has a drainage area of about 7,600 square miles. The majority of the 26-mile channel from Jacksonville to the ocean has been dredged to afford a minimum depth of 38 ft msl. The entrance is stabilized by two parallel jetties spaced 1,600 ft apart.

4. Tides occurring in the St. Johns River are semidiurnal in nature and have a mean range of about 5.2 ft at the entrance, which diminishes to about 2.0 ft at Jacksonville. The river is tidal above Jacksonville for some distance, with a mean tidal range in the vicinity of Hibernia Point (upstream limits of model) of less than 1.0 ft. The estuary is partially mixed, with differences between surface and bottom salinity concentration at the entrance of about 4.0 to 6.0 ppt. Under the influence of normal tides and freshwater discharge, salinity intrusion extends upstream to about mile 32. The mean tidal range at the entrance is about 4.5 ft; average freshwater discharge is about 4,475 cfs and ranges from negative freshwater inflow (evaporation exceeds inflows) in the summer months to 9,300 cfs in winter months.

5. Winds have considerable effects on the water level and velocity of currents. Strong northerly and northeasterly winds raise the water level about 2.0 ft at Jacksonville; strong winds from the opposite direction lower the water level about 1 ft and may increase or decrease flood and ebb current velocities.

PART II: THE MODEL

Description

6. The Mayport-Mill Cove model reproduces approximately 287 square miles of the prototype area including a portion of the St. Johns River upstream to Hibernia Point (4 miles upstream from Doctors Lake); about 93 square miles of the Atlantic Ocean from about 5 miles south and north of the respective jetties and offshore areas well beyond the -60 ft contour; and the system of sloughs, creeks, and rivers that affect tidal action throughout the model area. The Atlantic Intracoastal Waterway from the point of intersection with the St. Johns River navigation channel was reproduced about 5 miles in the north and south directions. The model upstream from South Jacksonville was bent slightly (11 degrees) to the east in order to fit it within the shelter. The Doctors Lake area was also bent 11 degrees to fit this area in the shelter. The limits of the area reproduced are shown in Figure 2 and Plate 1. General views of the lower and upper portions of the model are shown in Figure 3.

7. The model was constructed to linear scale ratios, model to prototype, of 1:500 horizontally and 1:50 vertically. From these basic ratios the following scale relations were computed by the Froudian relations: slope 10:1, velocity 1:7.07, time 1:70.7107, discharge 1:176,777, volume 1:12,500,000, area (cross section) 1:25,000, and area (horizontal) 1:250,000. The salinity and dye concentrations ratios for the study were 1:1. One prototype cycle (semidiurnal) of 12 hr 25 min was reproduced in the model in 10 min 32.34 sec. Horizontal grid coordinates are based on the Florida coordinate system (East Zone), and vertical control was based on USC&GS msl datum. The model was approximately 500 ft long and 100 ft wide at its widest point and covered an area of about 32,000 sq ft. It was completely enclosed to protect it and its appurtenances from the weather, and to permit uninterrupted operation.

8. The model was a fixed-bed type, molded to the most recent

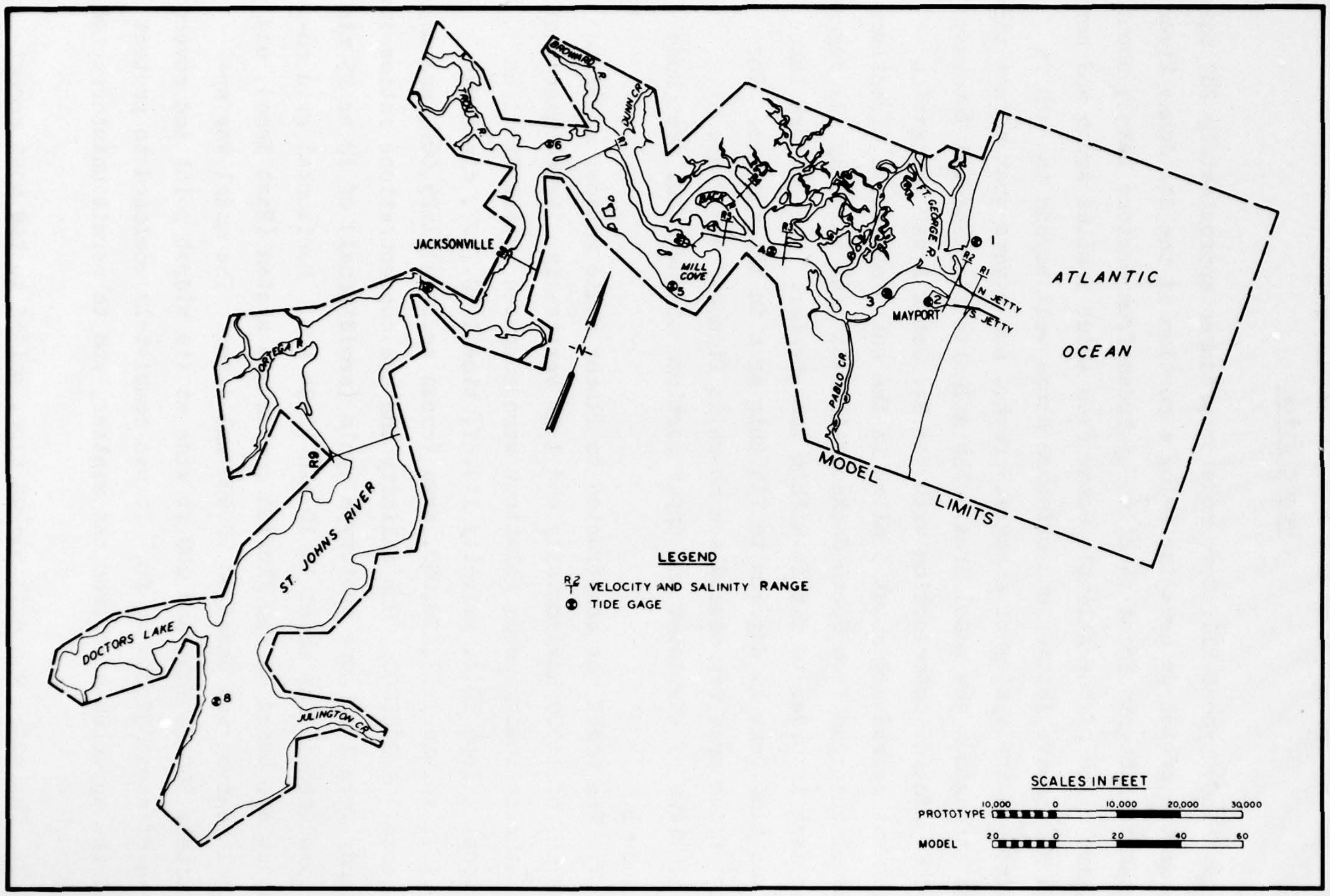
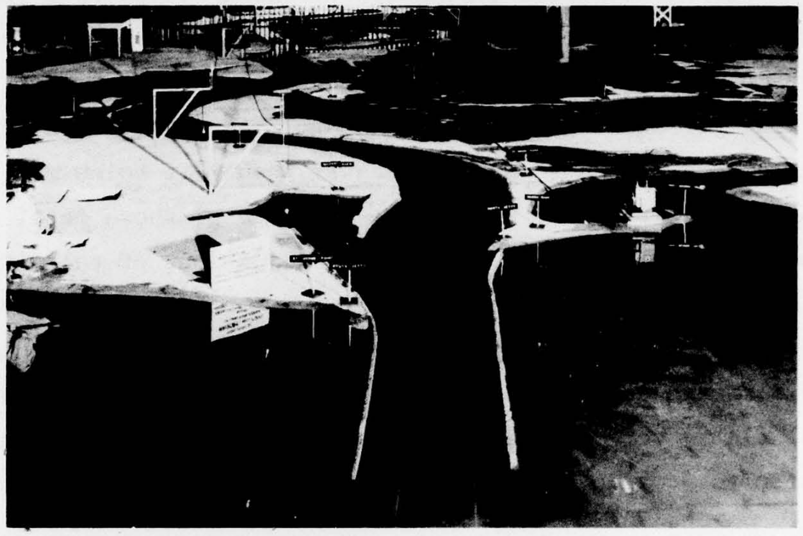
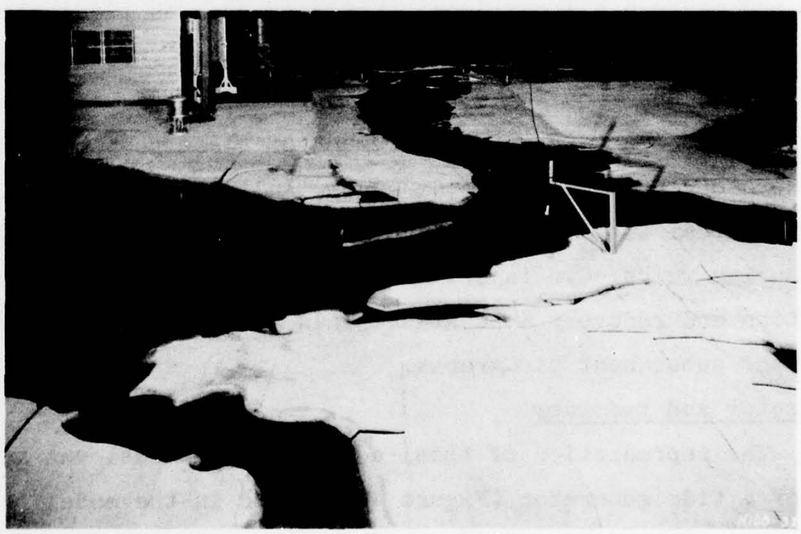


Figure 2. Model limits



a. Lower portion



b. Upper portion

Figure 3. General views of model

prototype hydrographic surveys. The navigation channel (bank to bank), from the entrance to Jacksonville, and the Mill Cove surveys were made by the Jacksonville District during 1974. The area upstream from Jacksonville, creeks, rivers, sloughs, etc., adjacent to the St. Johns River were molded to surveys made in 1934-35.

9. The permanent model roughness employed consisted of 3/4-in.-wide metal strips placed in depths greater than 3 ft below msl, and cut off below the low-water elevation. The use of these metal strips as roughness was necessary because proper adjustment of velocity and salinity distribution, both horizontally and vertically, in any given cross section could not be obtained by the use of ordinary boundary roughness alone in the deep areas of the model. The areas above -3 ft msl (tidal flats) were roughened by raking the model surface during construction to provide the desired degree of roughness.

Appurtenances

10. The model was equipped with the necessary appurtenances to reproduce and measure all pertinent phenomena such as tidal elevations, saltwater intrusion, current velocities, freshwater inflow, dispersion characteristics, and shoaling distribution. Apparatus used in connection with the reproduction and measurement of these phenomena included a tide generator and recorder, tide gages, salinity meters, salinity samplers, chemical titration equipment, current velocity meters, freshwater measuring weirs, dye injection and measuring equipment, and shoaling injection and recovery apparatus. This equipment is described in detail in the subsequent paragraphs.

Tide generator and recorder

11. The reproduction of tidal action in the model was accomplished by means of a tide generator (Figure 4) located in the model ocean. The tide generator maintained a differential between a pumped inflow of salt water to the model and a gravity return flow to the supply sump as required to produce all characteristics of the prototype tides at the control station (Little Talbot Island, gage 1). The tide generator was

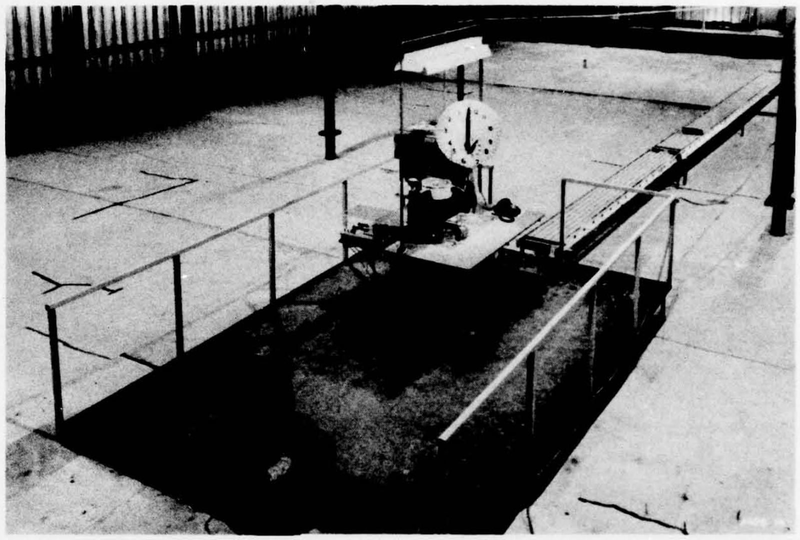


Figure 4. Tide generator and recorder

equipped with a continuous tide recorder so that the accuracy of the model tide reproduction could be checked visually at any time. The upstream limits of the model are well beyond the point of salinity intrusion for low freshwater inflows; however, the upstream limits are not beyond the limits of tidal influence. To accurately reproduce the boundary conditions at this point it was necessary to install a secondary tide control (Figure 5). The secondary tide control is composed of a sump (sufficient size to hold tidal flow upstream from this point), a supply pump (sufficient size to furnish outgoing tidal volume), and an adjustable or programmable control weir. Proper tidal height at this point is maintained by programming the control weir in sequence with the main tide control located in the ocean. On an incoming tide the weir crest is lowered, allowing tidal flow and pump flow to pass over the weir into the storage sump. The reverse procedure is followed on an outgoing tide, as the weir is raised to stop flow while the tidal volume is reintroduced into the model at this point by the supply pump.

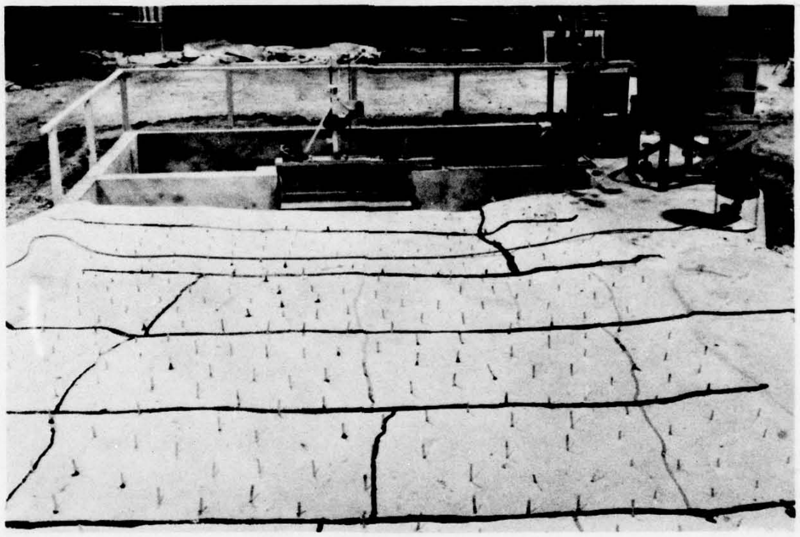


Figure 5. Secondary tide control

Tide gages

12. Permanently mounted point gages were installed in the model at the locations of the eight tide recording gages used for collection of field tide data (Figure 2). Portable point gages were used to measure tidal elevations at other points, as required. The model gages were graduated in 0.001 ft (0.05 ft prototype).

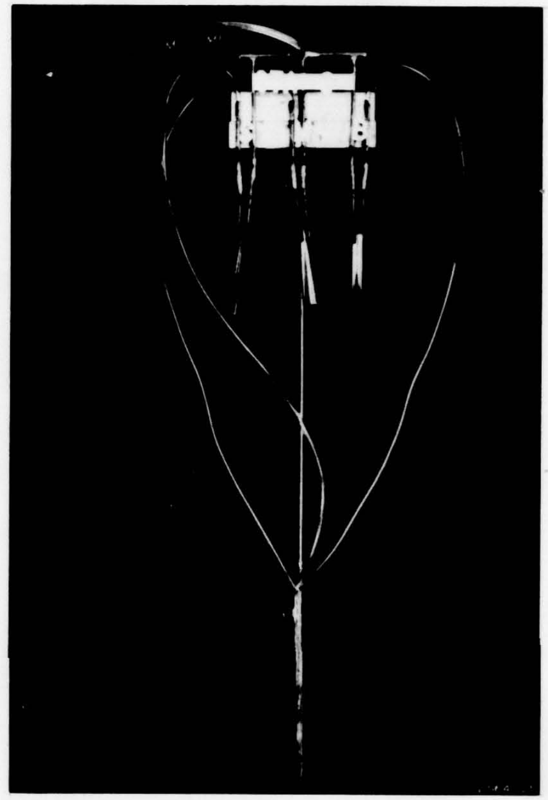
Salinity and dye samplers

13. Salinity and dye samples were drawn from the model into collection vials by negative pressure from a vacuum pump connected to a central manifold, which in turn was connected to tubes running to each sampling location. This device enabled simultaneous sampling at all desired depths at all sampling stations throughout the model. A multidepth sampler is shown in Figure 6.

Chemical titration equipment

14. This method of determining salinity concentration was used primarily to determine the salinity concentration at the saltwater

Figure 6. Multidepth sampler



source (sump). The equipment consisted of a graduated burette for measuring the volume of silver nitrate, pipettes for measuring the volume of samples used, sample jars in which to perform the titration, a supply of silver nitrate, and a quantity of potassium chromate for use as an end-point indicator in the titration process. The method consisted of adding a known concentration of silver nitrate solution to a known volume of the model salinity sample; the amount of silver nitrate required to precipitate the salt contained in the sample was then converted to salinity in parts per thousand of NaCl.

Salinity meters

15. All salinity concentrations for samples taken from the model were determined by use of conductivity cells especially built and calibrated for this purpose. The salinity meter assembly is shown in Figure 7.

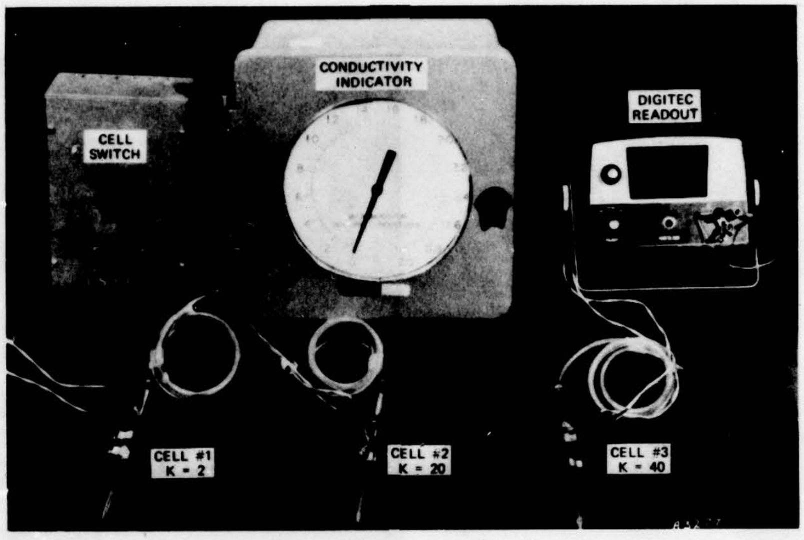


Figure 7. Salinity meter

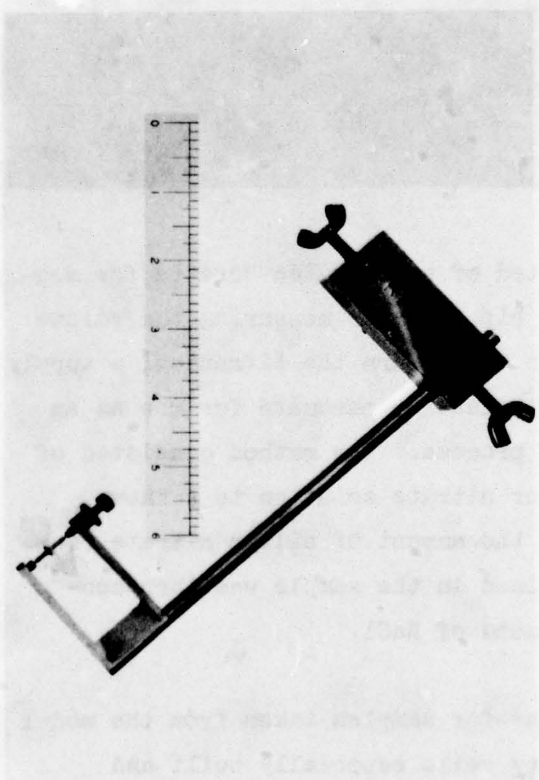


Figure 8. Miniature current velocity meter

Current velocity meters

16. Current velocity measurements were obtained with miniature Price-type current meters, one of which is shown in Figure 8 and with float devices. Subsurface current velocities in the Mayport Basin were measured by timing the travel of a drop of dye released at the appropriate depth over a given distance. The travel time over a given distance was obtained by use of a stopwatch, and later converted into prototype velocity in feet per second. Surface currents were obtained in a similar manner by timing the movement of a small float. This method was necessary because velocities in this area were generally too low and erratic to be accurately measured with the miniature Price meter.

17. The five meter cups, constructed of a light plastic or metal material, were approximately 0.04 ft (2 ft prototype) in diameter and were mounted on a horizontal wheel 0.11 ft (5.5 ft prototype) in diameter. The center of the cups was 0.05 ft (2.5 ft prototype) from the bottom of the frame. The meters were calibrated frequently to ensure accurate operation and were capable of measuring actual velocities as low as 0.03 fps (0.2 fps prototype).

Freshwater inflow measuring devices

18. All major rivers with significant mean freshwater inflows were equipped with a constant head tank and Van Leer weirs for precise measurement of freshwater inflows. The inflows of streams with minor freshwater inflows were combined with those of nearby streams of significant inflow. For the purpose of Mayport Basin tests reported herein, only freshwater inflow from the St. Johns River was introduced.

Skimming weir

19. The mixed salt water and fresh water that accumulated in the model ocean had to be removed in order to maintain a constant volume and a constant source salinity. This was accomplished by means of skimming weirs that removed a quantity of mixed water from the surface layer equal to the freshwater inflow to the estuary. Precise measurement of the combined discharge from the skimming weirs was made by use of a calibrated V-notch weir.

Dye injection and
measuring equipment

20. Model tests were made to determine the flushing rate and dispersion characteristics of plans. Two types of dye tests were conducted in the model. One type (Mill Cove study) involved the thorough mixing of a given weight of powdered fluorescent dye with a given volume of water and then storing the mixture in a glass-sided tank. The tank was equipped with a discharge line to the desired injection location. Located in the discharge line was a small, calibrated laboratory pump that ensured a uniform flow throughout the test period. The second type dye test, used for the Mayport Basin study reported herein, involved blocking off the access channel (secondary openings when appropriate) into the basin and mixing a known weight of powdered fluorescent dye (previously dissolved in salt water) with the water throughout the enclosed area as the model tide continued to operate normally. At the next low water the barrier in the access channel was removed, and collection of water samples was initiated and continued for a period of 16 tidal cycles. The exact procedure was followed for base and all plan tests to ensure that the initial concentration was the same for all tests. Water samples were collected at locations throughout the basin and adjacent river with a sampling device identical with the multidepth salinity sampler described in paragraph 13. Concentrations of the water samples were measured by means of a fluorometer (Figure 9).

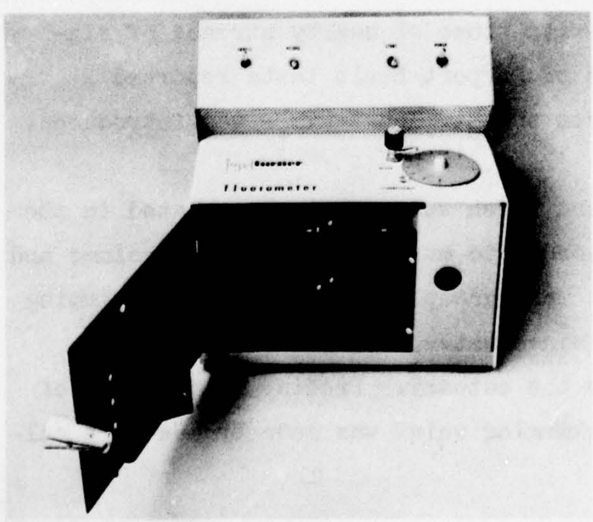


Figure 9. Fluorometer

Shoaling and recovery apparatus

21. Shoaling in the navigation channel was reproduced in the model with granulated (1/8 in. by 1/8 in.) polystyrene plastic having a specific weight of 1.05. The material used to simulate shoaling in Mayport Basin was gilsonite, a solid hydrocarbon with a specific weight of 1.035. The gilsonite was crushed and only those grain sizes between 0.500 and 0.707 mm were used. The gilsonite was introduced into the model in a slurry of 5 percent gilsonite and 95 percent water. The slurry was pumped from a holding tank to a manifold made of 3/4-in. copper pipe with 1/8-in. holes drilled in the bottom at selected intervals. Model test procedure for the above shoaling tests will be discussed later. At the conclusion of each test the shoaling material deposited within limits of the navigation channel and/or other prescribed areas was recovered and measured volumetrically.

PART III: VERIFICATION OF THE MODEL

22. The verification of the Mayport-Mill Cove fixed-bed model was accomplished in three phases: (a) hydraulic verification, which ensured that tidal elevations and times, and current velocities and directions were in proper agreement with the prototype; (b) salinity verification, which ensured that salinity phenomena in the model corresponded to those of the prototype for similar conditions of tide, ocean salinity, and freshwater inflow; and (c) fixed-bed shoaling verification, which ensured acceptable reproduction of prototype shoaling distribution and patterns within the navigation channel and in Mayport Basin.

23. The accurate reproduction of hydraulic and salinity phenomena in an estuary model is an important phase in the preparation of the model for its ultimate use in evaluating the effects of proposed improvements works. Every effort was made to obtain a comprehensive verification of all pertinent phenomena. Prototype data used for the model hydraulic and salinity verification were collected in the field by Jacksonville District and U. S. Army Engineer Waterways Experiment Station (WES) hydraulic personnel during the period of 11-13 June 1974, and 5-7 November 1974. The 34-ft navigation channel and Mayport Basin shoaling verification was based on historical data such as predredge and postdredge surveys and dredging records during the period between 1956 and 1972. The Mayport Naval Basin shoaling verification was based on annual shoaling rates calculated from dredging records covering the periods between 1959 and 1975.

Prototype Data

24. In June 1974 and November 1974 the Jacksonville District, in conjunction with the WES Hydraulics Laboratory, undertook a prototype metering program in the St. Johns River to obtain data with which to adjust and verify the Mayport-Mill Cove estuary model. Two prototype surveys were conducted to secure data covering two freshwater inflow prototype conditions. The survey conducted 11-13 June 1974 represented

a period of low freshwater inflow, while the 5-7 November 1974 survey represented a period of high freshwater inflow.

25. Prototype observations of current magnitude and direction and salinity concentrations were made at the surface, middepth, and bottom where depths permitted for a period of 13 consecutive hours. Simultaneous observations were made at 18 locations on 4 ranges on the first day of each survey period in the lower or downstream portion of the estuary. Equipment and station location buoys were relocated on the second day. On the third day, simultaneous observations were made at 16 locations on 5 ranges during the June survey and at 19 locations on 6 ranges during the November survey. One range (range 3) was monitored each day. Observations were made for both the June 1974 and November 1974 surveys for the purpose of correlating the data obtained in the two areas of the estuary. Several observations were made at the three stations on the range in Mill Cove (range 10) on the second day of the November 1974 survey. The location of ranges and stations monitored during the above periods are shown in Plate 1.

26. Throughout the model verification phase the following prototype freshwater inflows were introduced into the model: 2,850 cfs for the low-inflow period (11-13 June 1974); 9,240 cfs and 8,940 cfs for the high-inflow periods during the 5th and 7th November surveys, respectively. The above freshwater inflow was introduced into the St. Johns River at the upstream end of the model during model verification tests for each of the respective periods. During each period of the June 1974 prototype survey, a total of 350 cfs was introduced at the various tributary streams. No tributary freshwater inflow was introduced during the November 1974 survey period tests. Model freshwater inflow values were determined by averaging the measured prototype discharges occurring during the date of the survey and three days prior to the survey. During the salinity verification phase of the study, it was determined that the prototype freshwater inflow rates had to be adjusted slightly in the following manner: low freshwater inflow rate was decreased by 25 percent and high freshwater inflow rate was increased by 25 percent. The freshwater inflow rates listed above reflect

the 25 percent increase or decrease, respectively, for the two periods. Since this degree of change is on the same order as the accuracy of the prototype discharge measurements, such adjustment is considered to be quite justified. All final verification results discussed below utilized the adjusted freshwater inflow values.

Hydraulic Verification

Tidal adjustment

27. The objective of the model tidal adjustment was to obtain an accurate reproduction of prototype tidal elevations and tidal phases throughout the model. Prototype tidal data from eight recording tide gages (Plate 1) were available to verify the accuracy of the model tidal adjustment. These gages are permanent gages of the Jacksonville District and recorded essentially continuously throughout the year of 1974.

28. The procedure followed was to adjust the tide generator in such a manner that the tides generated in the model ocean would cause an accurate reproduction of prototype tides at gage 1 (Little Talbot Island), then to adjust the model roughness until prototype tidal elevations and times were reproduced to scale throughout the model.

29. Comparison of model and prototype tidal data for the four tide conditions reproduced in the model are presented in Plates 2-13. These plates show tidal elevations for the 11-13 June and 5-7 November tide conditions at Little Talbot Island (gage 1), Mayport Basin (gage 2), Coast Guard Station (gage 3), Ft. Caroline (gage 4), Mill Cove (gage 5), Navy Fuel Depot (gage 6), Jacksonville (gage 7), and Creighton Island (gage 8). High-, mean-, and low-water levels and range of tide profiles at locations along the channel are presented in Figures 10-13 for the 11-13 June 1974 and 5-7 November 1974 tide conditions, respectively.

30. The greatest discrepancy occurred during verification of the 7 November 1974 tidal heights. A close examination of prototype tidal records revealed that for several days preceding the 5 and 7 November 1974 prototype surveys, an unusually low tidal plane or mean tide level existed in the prototype system. Likewise, the tidal

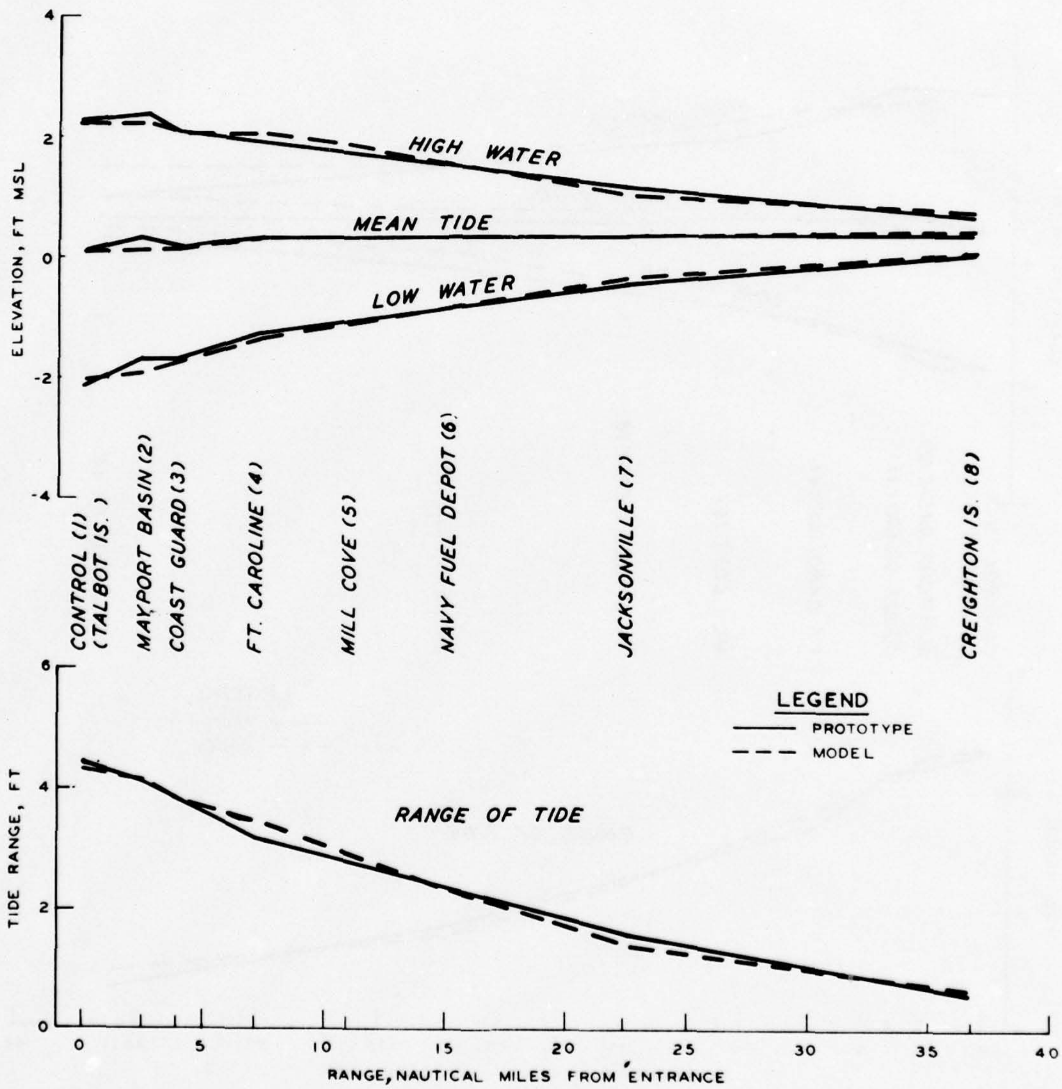


Figure 10. Tide profiles, model versus prototype, 11 June 1974

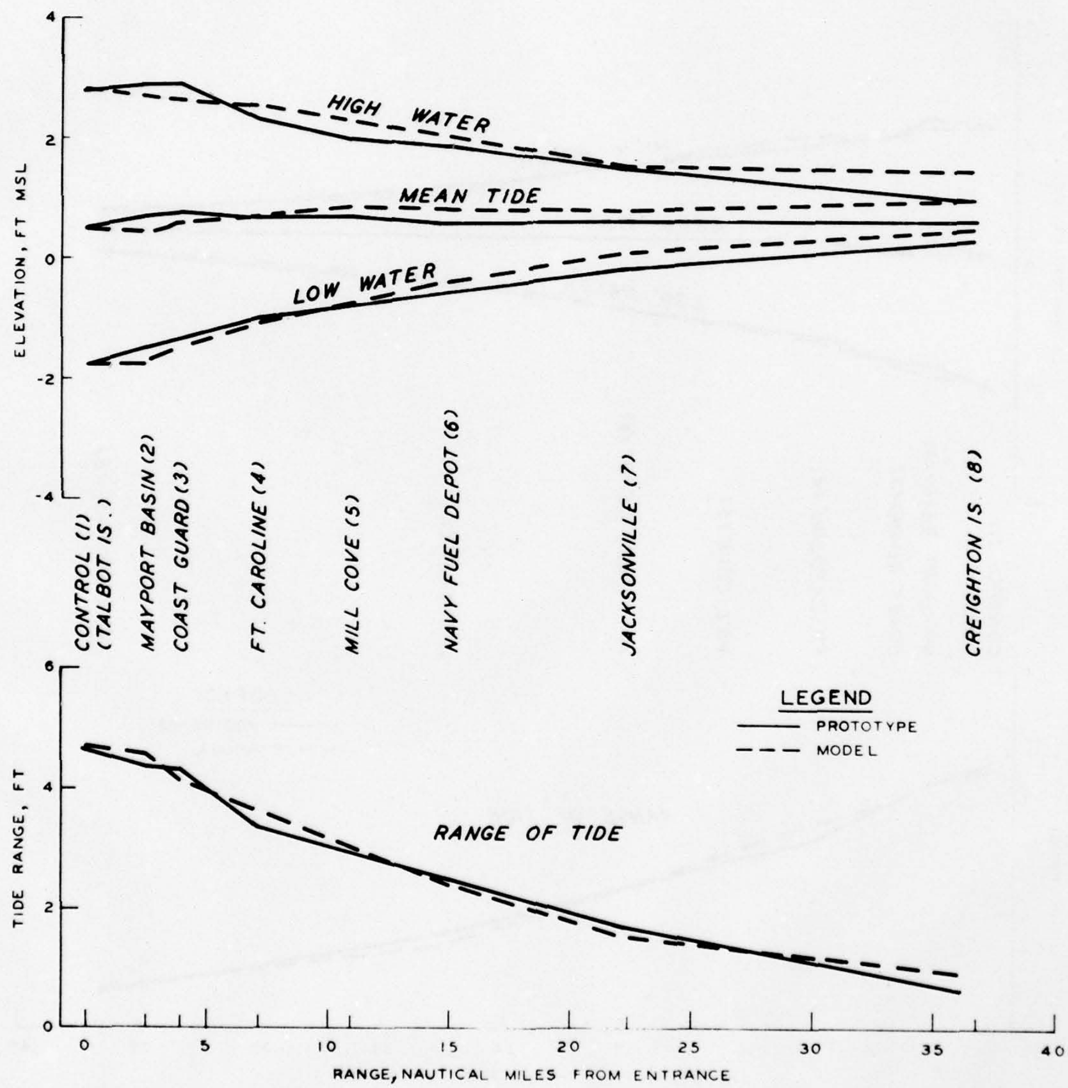


Figure 11. Tide profiles, model versus prototype, 13 June 1974

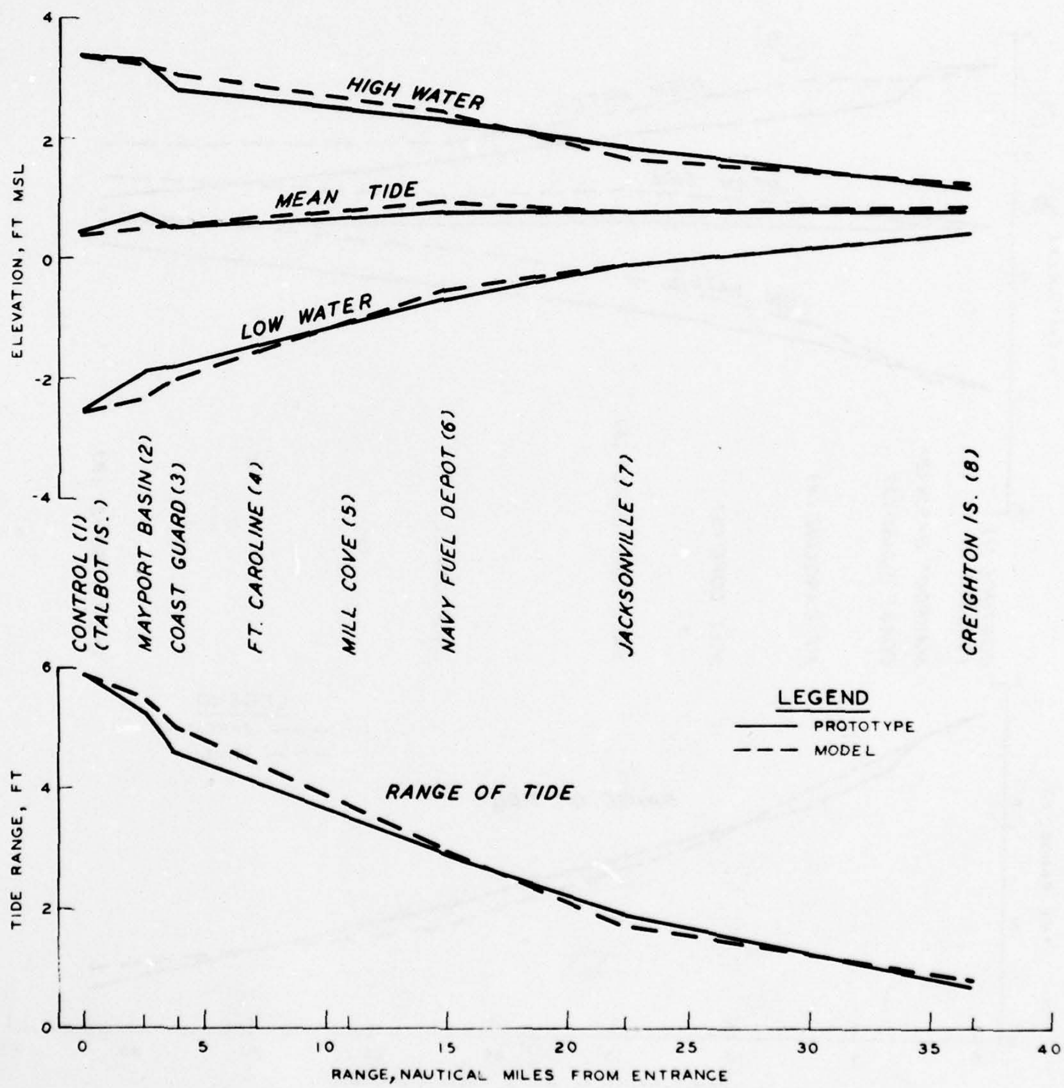


Figure 12. Tide profiles, model versus prototype, 5 November 1974

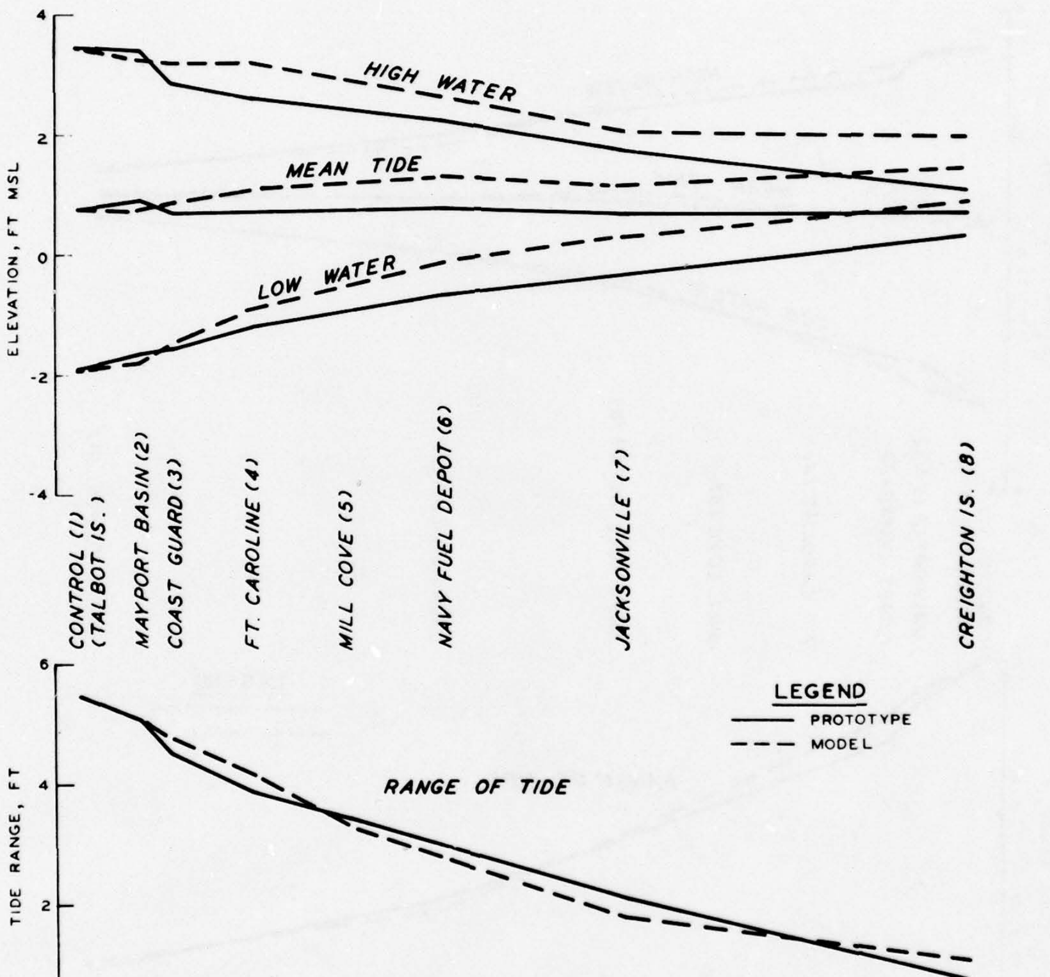


Figure 13. Tide profiles, model versus prototype, 7 November 1974

records showed that the days of survey (5 and 7 November) were the beginning dates in which this trend was reversed, as the system went into an unusually high plane. The probable cause of this was unusually high wind effects in the area. Model tide levels for these dates, particularly 7 November, were generally about 0.5 ft higher than prototype levels, which was due primarily to the stabilized plane of operation in the model. Model levels are stabilized through repetitive operation with the same tide, range, level, etc., cycle after cycle. Prototype current velocity measurements made on these dates show an unusually high flood predominance, caused by the rapid filling of the system as it went from a low plane to a higher plane. The model did not reproduce this unusual setdown, nor could it be expected to do so, without somehow reproducing the wind setdown and the daily tides that occurred for several days preceding the surveys as the tidal plane returned to normal. It is believed that if this had been done, the model would have accurately reproduced the unusually low tide levels and the high flood currents experienced in the prototype on the dates of the November surveys. The control tide at Little Talbot Island was advanced 1 hr for the 7 November test in an effort to minimize the effects of the above unusual effects.

Adjustment of currents

31. The objective of the model current adjustment was to obtain an accurate reproduction of prototype current velocities and distributions throughout the model. Prototype current velocity data were available at 37 locations located on 10 ranges, the locations of ranges and stations are shown in Plate 1. Prototype observations were made at the surface, middepth, and bottom where depth permitted for a period of 13 hr at each station. Only surface and bottom depths were monitored at locations where water depth was 10 to 12 ft. At locations where water depth was less than 10 ft, only the middepth velocity was measured.

32. The procedure followed for adjustment of current velocities was to reproduce each of the four tidal and discharge conditions in turn and adjust the model roughness until the current velocities at each metering station were reproduced in the model to an acceptable accuracy.

33. Comparison of model and prototype current velocities for all

stations on each prototype survey date are shown in Plates 14-93. Measurements obtained at hourly intervals were plotted for both model and prototype, and smooth curves were drawn through the points. These data show that the maximum discrepancies during model verification tests occurred for the 7 November 1974 tidal condition (mainly at ranges 3, 5, and 6). The cause for this discrepancy was due to the condition discussed in paragraph 30 above. The prototype current data, reflecting the effects of measuring tidal plane, showed extremely high flood currents and flood predominance. These phenomena could not be reproduced in the model. It is believed that the model would have accurately reproduced these conditions if the previous 3 to 4 days of tide conditions had been reproduced prior to data collection in the model. However, this would have been very difficult to do in the model, and was not considered worth the effort since a very good verification had been achieved with the June prototype data. No attempt will be made to discuss each comparison of prototype and model measurement, but the agreement obtained throughout the model is considered to be very satisfactory.

Salinity Verification

34. The objective of the model salinity adjustment was to obtain an accurate reproduction of the vertical and lateral distribution of prototype salinities throughout the model. Reproduction of prototype salinity phenomena in the model required the maintenance of the proper salinity in the ocean water supply system and the establishment of the proper mixing environment. The prototype salinity data used in this phase of the study were obtained simultaneously with the above hydraulic data. Salinity observations were made at hourly (prototype) intervals in both the model and prototype. These data were plotted and smooth curves drawn through the points and are compared with corresponding prototype curves in Plates 94-173. The agreement demonstrated between model and prototype is considered good. It is pointed out that no additional adjustment of the model roughness was necessary to obtain the agreement shown in Plates 94-173. This substantiates the model

adjustment of tides and currents and indicates that the upland fresh water was being properly mixed with salt water from the ocean supply.

35. As discussed in paragraph 26 above, 25 percent was added to the high inflow rate (November survey) and subtracted from the low inflow rate (June survey). These adjusted inflow values were subsequently used in the final verification phases for tides, velocities, and salinities.

Shoaling Verification

Background

36. The value of any model study is dependent on the proven ability of the model to produce with a reasonable degree of accuracy the results that occur in the prototype under given conditions. It is essential, therefore, that agreement first be established between the model and prototype before any model tests of proposed improvement plans are undertaken.

37. The similitude requirements for hydraulic phenomena, dominated by gravitational forces, are satisfied by Froudian scaling of fixed-bed hydraulic models; however, gravitational forces alone do not influence sediment motion. In fact, sedimentation processes are so poorly understood that it is not yet possible to establish the appropriate model scaling relations for sedimentation studies. It then becomes necessary to depart somewhat from hydraulic similitude by adjusting the various hydraulic forces and developing procedures of model operation so that effects on model bed material will be such that the deposition of material will be similar to the prototype. This process of attaining similarity between prototype and model shoaling or bed movement is accomplished through the empirical process known as the "verification" of the model. Model shoaling verification is accomplished by intricate cut-and-try process of adjusting the various hydraulic forces and model operation techniques until the model will accurately reproduce known prototype shoaling distribution patterns.

Purpose

38. The purpose of the shoaling verification was to define the

model operation conditions required to reproduce known prototype shoaling patterns throughout the length of the navigation channel from the outer bar to Jacksonville, and in Mayport Basin. This was necessary before shoaling studies could be conducted in the model. Shoaling verification was accomplished in two phases: (a) navigation channel and (b) Mayport Basin.

Prototype data

39. The information used in the fixed-bed channel shoaling verification was furnished WES by the Jacksonville District and consisted of prototype data and calculations covering a period of 16-1/2 years from March 1956 to November 1972. The prototype data used for shoaling verification of the Mayport Basin covered the period between August 1959 to February 1975.

40. The hydraulic and salinity verification phases of the model study were conducted with conditions of the authorized 38-ft navigation channel as existing during the two prototype surveys in June and November 1974. However, the newly authorized and implemented 38-ft navigation channel had not been in operation for sufficient time to yield reliable annual shoaling rates or patterns. Therefore, the old 34-ft channel dimensions were molded into the model and the channel shoaling verification phase of the study was conducted for this condition. The Mayport Naval Basin shoaling verification was likewise conducted with the 34-ft channel dimensions molded in the model.

41. The navigation channel, beginning on the outer bar and ending in the Jacksonville area, was divided into eight reaches as shown in Plates 174-177. Shoaling sections used in the Mayport Basin shoaling verification are shown in Plate 174. Each reach was further divided into individual sections of varying lengths and widths, as shown in the above plates, in accordance with information furnished with the prototype shoaling records, etc. For the purpose of simplifying model shoaling verification, shoaling in individual sections was converted into a percentage of the total annual shoaling rate for the entire channel length and for each individual reach. Shoaling sections for the basin utilized only the exit channel, the slip, and basin

proper, which was divided into four sections of approximately equal size.

Test procedure

42. The model shoaling procedure was developed by varying the amount of shoaling material introduced, the rate and location of the introduction, the time and duration of introduction periods, the duration of the tests, and model conditions (tides, freshwater inflows, and model roughness).

Navigation channel

43. After several months of model experimental work, a shoaling material was selected and a technique developed that resulted in a very satisfactory reproduction of shoaling rates and patterns throughout the channel length. The entire length of the navigation channel (eight reaches) was verified simultaneously. The composite verification (excluding reach H - Blount Island Channel) for the entire channel is shown in Figure 14. Shoaling verification achieved for individual reaches

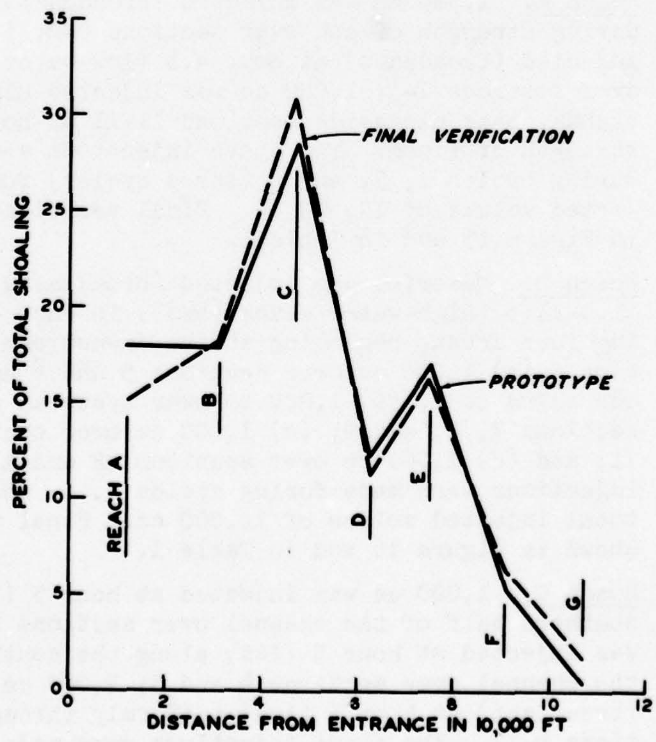


Figure 14. Navigation channel shoaling verification

A, B, C, D, E, F, G, and H are shown in Figures 15-22, respectively. The model conditions and final procedure developed for the channel are described in the following paragraphs.

44. Model conditions were: a 5.1-ft tide range at Little Talbot Island, a freshwater inflow of 9,000 cfs, and a source salinity concentration of 33.0 ppt. The model was operated for nine tidal cycles for stability prior to initiation of injection of shoal material. The shoaling material was granulated plastic with a mean grain size of about 1/8 in. and had a specific weight of 1.05. Injection of carefully measured volumes of material was accomplished over a seven tidal-cycle period throughout the entire navigation channel in the following manner. Injection was generally accomplished by broadcasting the material by hand uniformly over the test sections. However, exceptions to this type of injection were used and will be noted in the following descriptions, reach by reach.

a. Reach A. 1,500 cc was injected (broadcast) at hour 0.5 during strength of ebb over sections 0-2; 1,000 cc was injected (broadcast) at hour 4.5 (low-water slack (lws)) over sections 1-5; 1,000 cc was injected along the south channel bank alongside sections 11-21 at hour 7.0 during strength of flood. The above injections were made during cycles 1, 3, and 5 (three cycles) for a total injected volume of 10,500 cc. Final verification is shown in Figure 15 and in Table 1.

b. Reach B. Material was injected (broadcast) during hours 11.0-11.5 (high-water slack (hws)) in each of the following four areas, beginning at the downstream end of section 5 (a) 1,000 cc over sections 5 and 6 and downstream one third of 7; (b) 1,000 cc over upstream two thirds of sections 7, 8, and 9; (c) 1,000 cc over sections 10 and 11; and (d) 1,000 cc over sections 12 and 13. The above injections were made during cycles 3, 5, and 7 for a total injected volume of 12,000 cc. Final verification is shown in Figure 16 and in Table 1.

c. Reach C. 1,000 cc was injected at hour 5 (lws) along the southern half of the channel over sections 1-3; 1,000 cc was injected at hour 5 (lws) along the southern half of the channel over sections 4 and 5; 3,000 cc was injected (broadcast) at hour 5 (lws) uniformly throughout sections 6-17. The above injections were made during cycles 2, 4, and 6; 1,000 cc was injected (broadcast) at hour 12:25 (hws) over sections 18-21 during cycles 2,

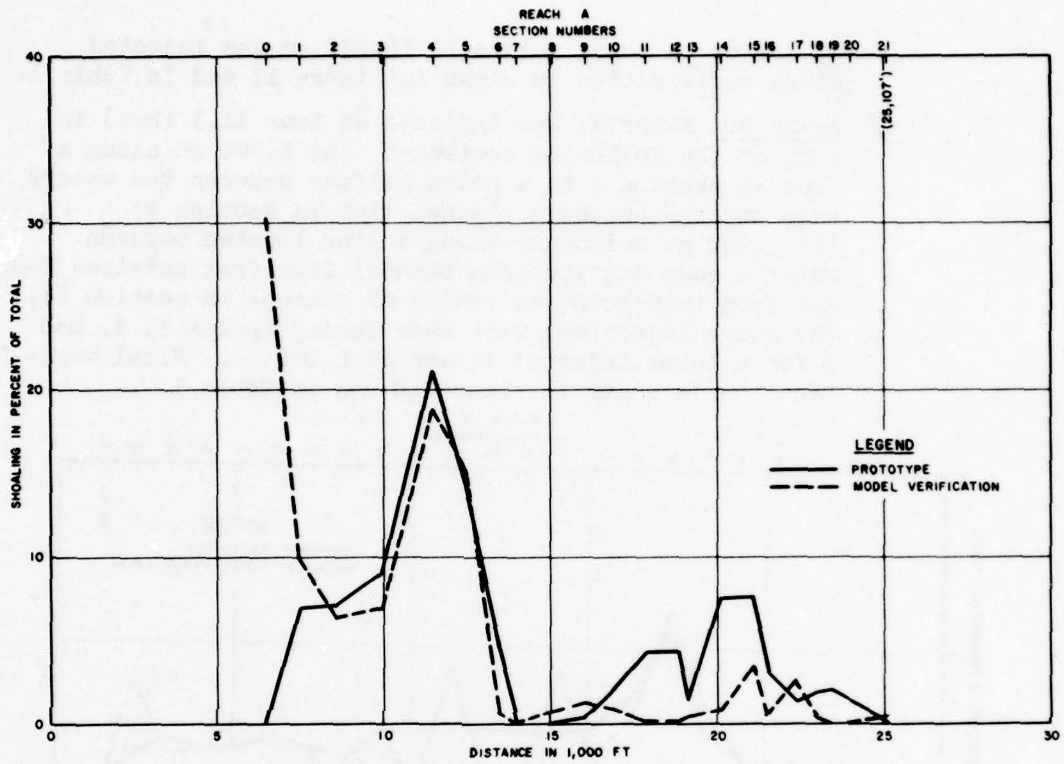


Figure 15. Shoaling verification, reach A

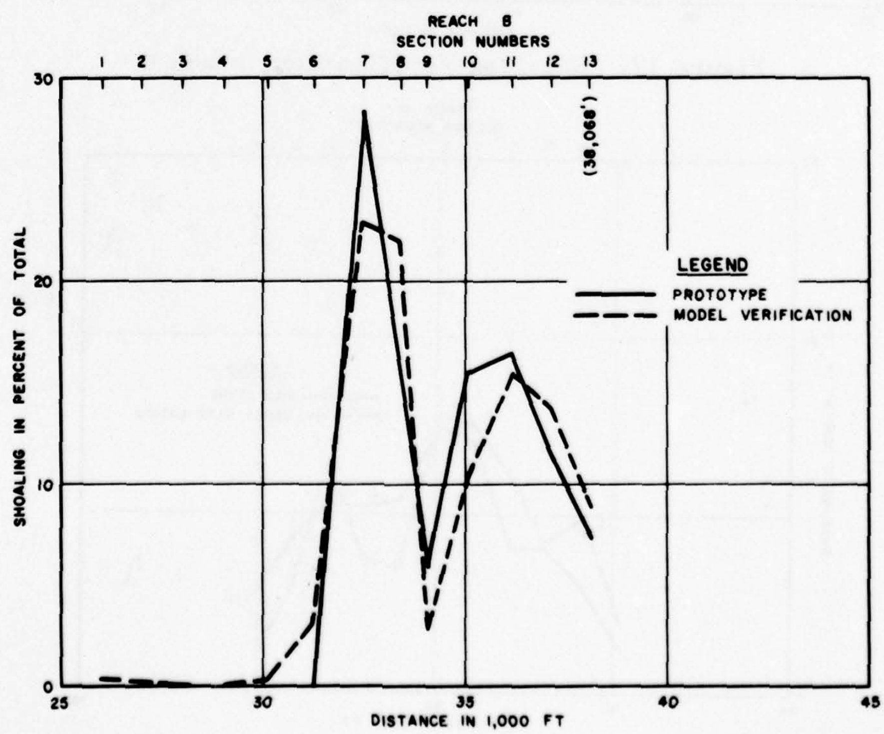


Figure 16. Shoaling verification, reach B

4, and 6. A total volume of 18,000 cc was injected. Final verification is shown in Figure 17 and in Table 1.

d. Reach D. Material was injected at hour 11.5 (hws) in each of the following sections: (a) 1,000 cc along a line in section 2 to a point halfway between the waters edge and the southern channel line in section 4; (b) 1,000 cc uniformly along a line located between water's edge and southern channel line from sections 7-9, and from this point to center of channel in section 11. The above injections were made during cycles 3, 5, and 7 for a total injected volume of 6,000 cc. Final verification is shown in Figure 18 and in Table 1.

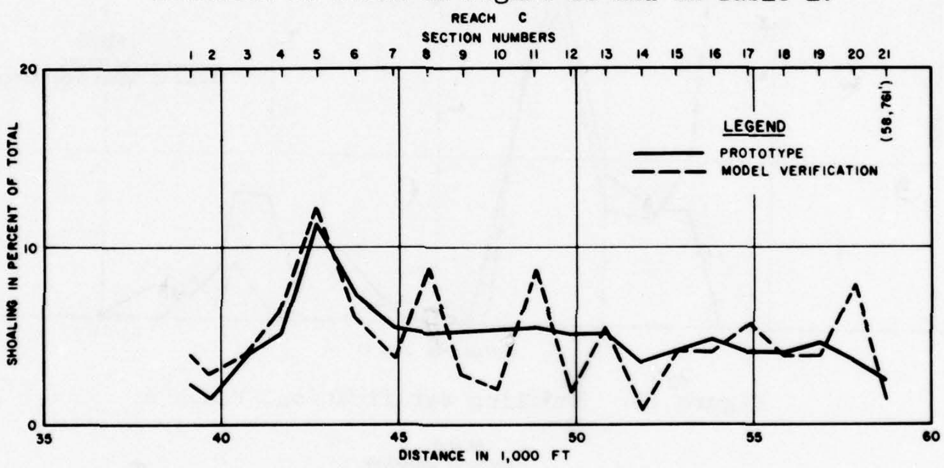


Figure 17. Shoaling verification, reach C

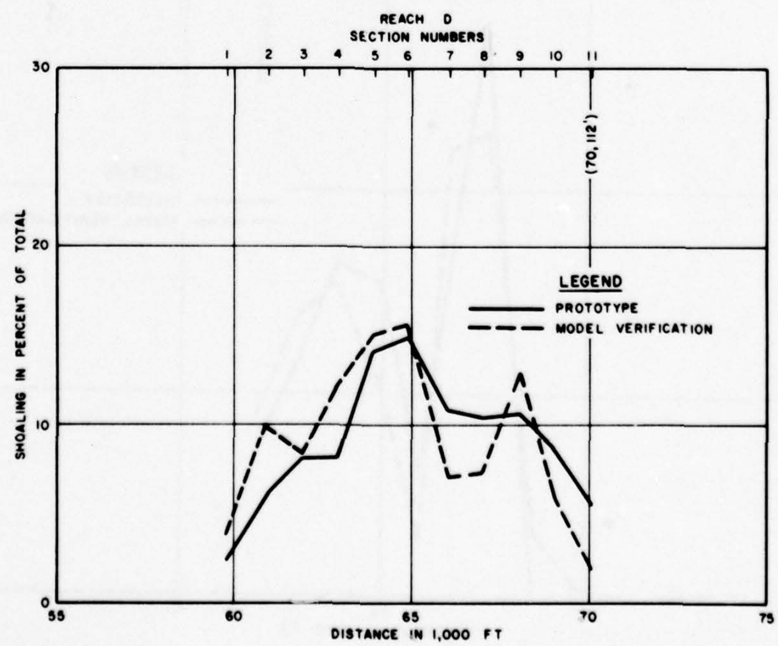


Figure 18. Shoaling verification, reach D

e. Reach E. 2,000 cc was injected uniformly between hours 2 and 4 (during ebb flow) along the channel slope located along the southeastern side of the channel from section 6 to halfway through section 9. This injection was made during cycles 1, 3, and 5. Beginning at hour 12 (hws) in cycle 5 only, a volume of 4,000 cc was injected uniformly (broadcast) throughout sections 1-16. A total volume of 10,000 cc was injected in reach E. Final verification is shown in Figure 19 and in Table 1.

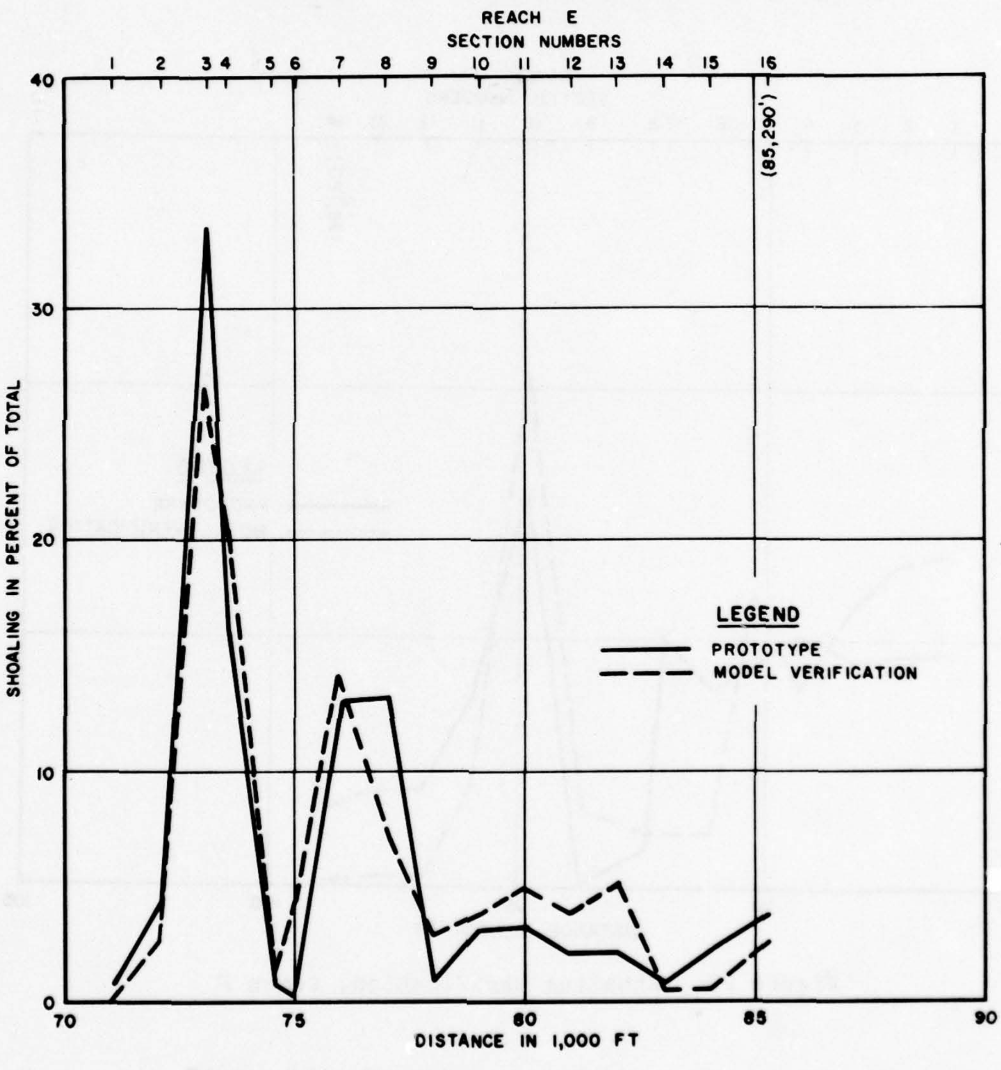


Figure 19. Shoaling verification, reach E

f. Reach F. 1,000 cc was injected (broadcast) at hour 6 in cycle 3 over sections E-16 (reach E) through section 2 in reach F; 1,000 cc was injected (broadcast) at hour 6 in cycle 4 throughout sections F-7 to F-11; 1,000 cc was broadcast at hour 6 in cycle 5 throughout section F-1 to F-3; 1,000 cc was broadcast at hour 6 during cycle 6 throughout sections F-7 to F-11. Total injection in reach F was 4,000 cc. Final verification is shown in Figure 20 and in Table 1.

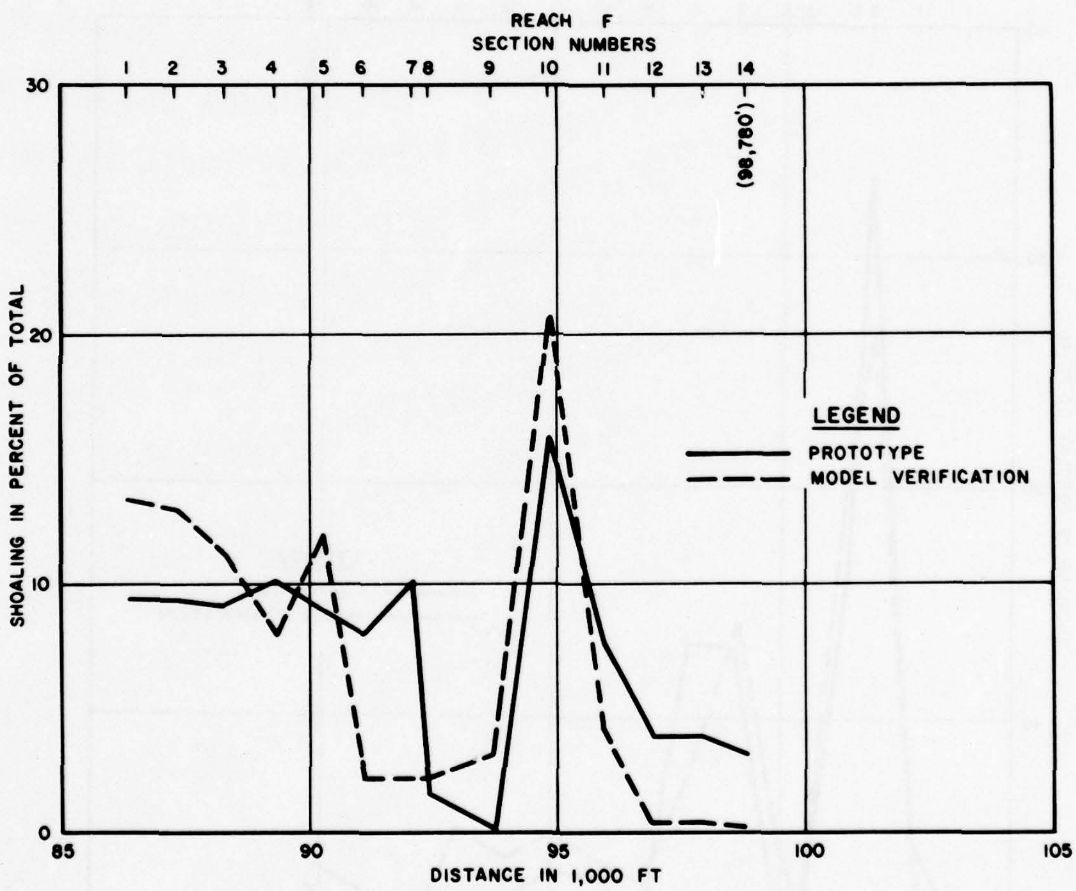


Figure 20. Shoaling verification, reach F

g. Reach G. 1,000 cc was injected (broadcast) uniformly at hour 6.5 (hws) in cycle 5 throughout the reach, sections 1-18. Final verification is shown in Figure 21 and in Table 1.

h. Reach H. 10,000 cc was injected (broadcast) uniformly through reach H (sections 1-7) at hour 11 (hws) in cycle 1. The final verification is shown in Figure 22 and in Table 1.

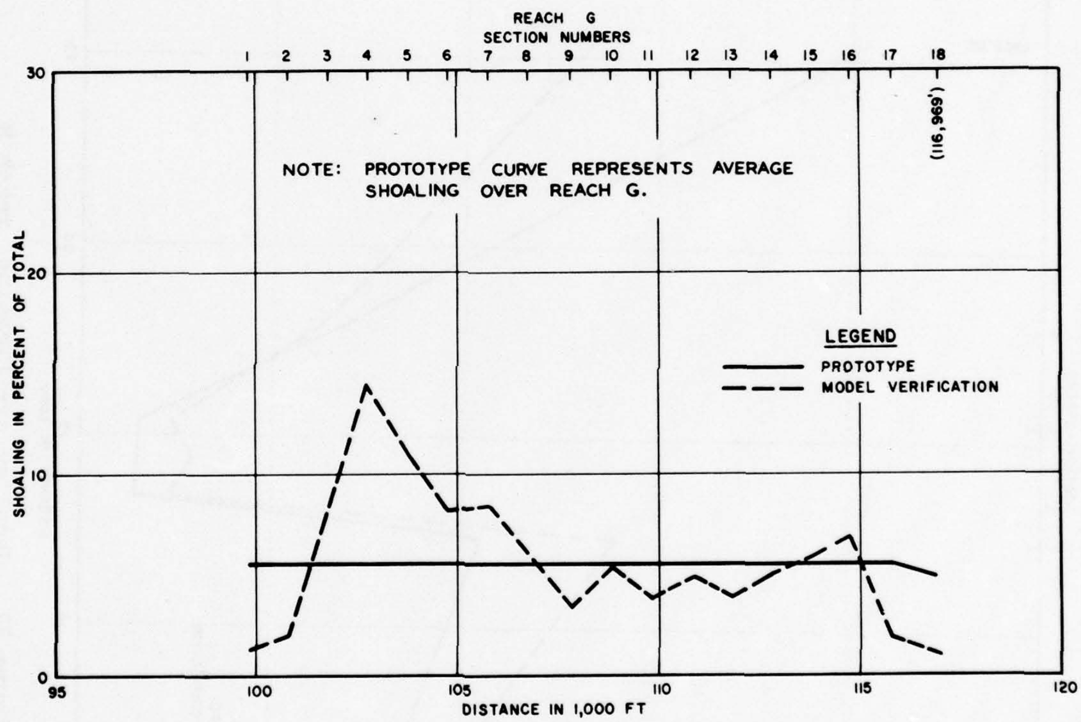


Figure 21. Shoaling verification, reach G

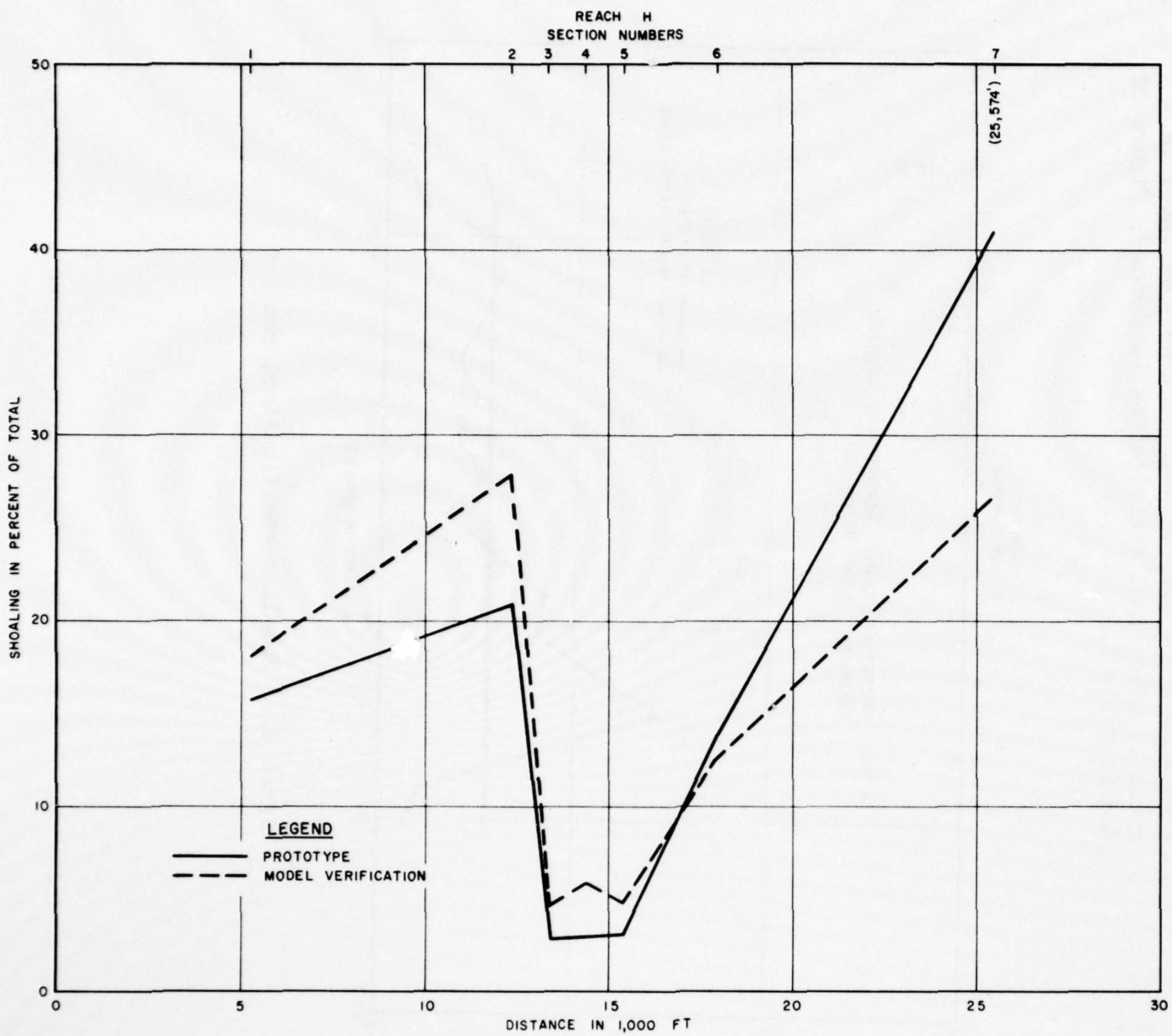


Figure 22. Shoaling verification, reach H

45. Following the last injection, one clear cycle (cycle in which no injection was made) was run prior to stopping the model. Model operation was stopped at hour 9 (hws) and the material deposited in each section within each individual reach was recovered and measured. Material deposited outside of the navigation channel was not measured. When the tentative shoaling verification was attained, the test was repeated to ensure that the results could be repeated with reasonable accuracy. The prototype average annual shoaling rate for the main navigation channel and the Blount Island Channel (reach H) was 703,200 cu yd. This volume was simulated in the model with 62,801 cc (average of two runs) of model sediment material.

Mayport Naval Basin

46. The shoaling verification for the basin was independent from the channel shoaling verification, but was conducted with the 34-ft channel installed in the model. Final model conditions and procedure are described below. The model was operated for a 5.9-ft tide range at Little Talbot Island, a freshwater inflow of 9,000 cfs, and a source salinity concentration of 33.0 ppt. The model sediment used was gilsonite, a solid hydrocarbon with a specific weight of 1.035. The gilsonite was crushed, and only those grain sizes between 0.500 and 0.707 mm were used. The material was introduced into the model in a slurry of 5 percent gilsonite and 95 percent water. The slurry was pumped from a tank to a manifold made of 3/4-in. copper pipe with 1/8-in. holes drilled in the bottom at selected intervals. The manifold was suspended about 1.5 ft above the water surface.

47. The model was operated for a period of nine tidal cycles for salinity stability prior to injection. Injection was accomplished over the next 12 tidal cycles. Three clear cycles were run following the last injection, then the model operation was stopped at hour 9 (hws) and the deposited material retrieved and measured. The injection was accomplished in the following manner. Throughout the injection period (cycles 1-12) 250 cc was injected each cycle between hours 1.5 and 4.0 (ebb flow) along the south side of the main navigation channel beginning at a point opposite the downstream end of Wards Bank training wall

and ending upstream from this point, a distance of 7,500 ft (prototype). During cycles 2, 4, 6, 8, 10, and 12, 250 cc was also injected along the south jetty beginning at a point approximately 2,000 ft (prototype) upstream from the oceanward end of the south jetty and ending at the intersection of the basin exit channel and the navigation channel, a distance of 3,000 ft (prototype).

48. The final verification is shown in Figure 23 and in Table 1. The prototype average annual shoaling rate of 404,500 cu yd was simulated in the model with 2,483 cc (average of two runs) of model sediment.

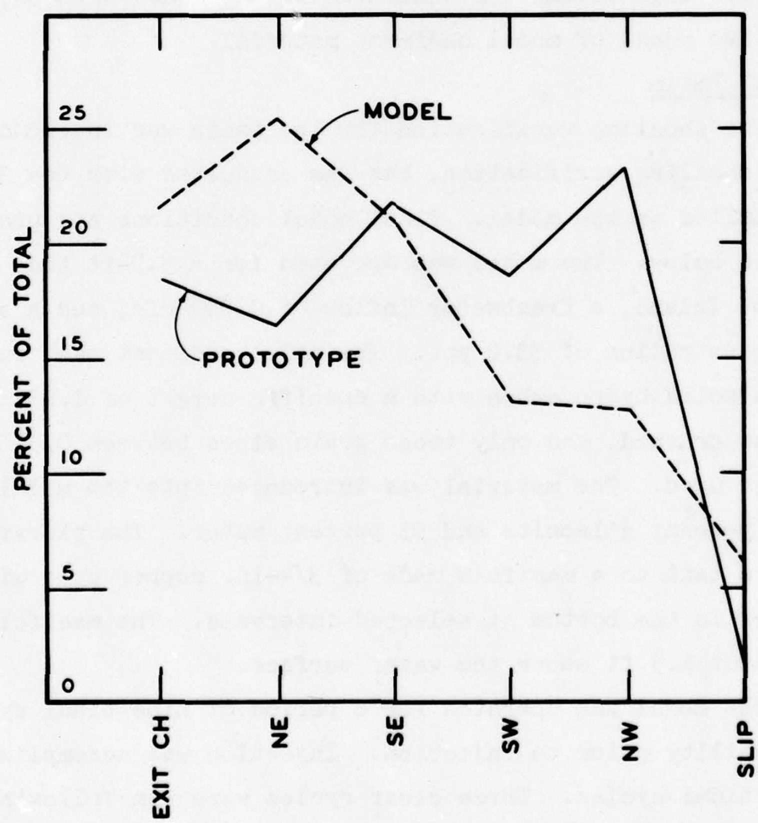


Figure 23. Mayport Basin shoaling verification

Limitations of Accuracy of Model Measurements

49. Measurements of tidal elevations in the model were made with point gages graduated to 0.001 ft, or 0.05 ft prototype. The limitations of the current velocity meters used in the model should be considered in making close comparisons between model and prototype velocity data. The center line of the meter cup was about 0.05 ft above the bottom of the frame; therefore bottom velocity measurements in the model were actually obtained at a point 2.5 ft (prototype) above the bottom instead of about 2.0 ft as in the prototype metering program. Model velocities were determined by counting the number of revolutions in a 10-sec interval (which represented a period of about 12 min in the prototype), as compared with about 1-min observation in the prototype. The horizontal spread of the entire meter cup wheel was about 0.11 ft in the model, representing about 55 ft in the prototype, as compared with about 0.5 ft for the prototype meter. Thus, the distortion of area (model to prototype) results in comparison of prototype point velocities with model mean velocities for a much larger area. The same is true for the vertical area, since the height of the meter cup was about 0.04 ft (2.0 ft prototype) as compared with only a few inches for the prototype meter. Middepth measurements in the model were made at a point midway between the bottom and an average of low tide and high tide elevations.

50. All model salinity measurements presented in this report were made with a calibrated salinity meter (conductivity type) and are considered to be accurate within 0.5 ppt in the higher range and 0.2 ppt in the lower ranges. Model samples were collected at the bottom, middepth, and surface. The elevations of the bottom and middepth samplers were fixed in the model and were not allowed to vary with the tide as was the surface sampler. Simultaneous water samples were drawn into vials from the three elevations by means of a vacuum system. Similar to the model velocity data, the model salinity data also represent an average over a much larger prototype area, since the vacuum sampling system used in the model drew the sample from a radius of about 0.05

to 0.10 ft (25 to 50 ft in the prototype). The accuracy with which the model could be expected to duplicate salinities from cycle to cycle for identical conditions appears to be about ±5 percent.

51. Shoaling tests are considered to be repeatable within ±8 to 10 percent. Although it is not possible to use model shoaling tests for quantitative predictions with a high degree of reliance, the model results do provide an excellent qualitative measure of the changes in shoaling patterns to be caused by various plans under study and of the relative shoaling rates among various plans.

Results of Verification Tests

52. Agreement between model and prototype phenomena, as evidenced by the results of hydraulic, salinity, and shoaling verification data, appeared to be reasonable. The model was considered to be sufficiently similar to its prototype to be confidently utilized in studies of the effect of proposed improvement plans.

Table 1

Shoaling Verification, Navigation Channel and Basin

Section	Prototype: Average Annual Shoaling Rate cu yd	Prototype: Percent of Total	Model: Volume Retrieved (Plastic), cc	Model: Percent of Total Recovered
		Reach A		
0	0	0.0	2,537	30.3
1	7,500	6.9	836	10.0
2	7,700	7.1	533	6.4
3	9,700	9.0	590	7.0
4	23,000	21.2	1,570	18.8
5	15,100	14.0	1,267	15.1
6	5,100	4.7	47	0.6
7	0	0.0	0	0.0
8	0	0.0	57	0.7
9	300	0.3	97	1.2
10	2,100	2.0	73	0.9
11	4,700	4.3	17	0.2
12	4,800	4.4	20	0.2
13	1,600	1.5	37	0.4
14	8,100	7.5	77	0.9
15	8,200	7.6	287	3.4
16	3,300	3.0	40	0.5
17	1,400	1.3	217	2.6
18	2,000	1.8	37	0.4
19	2,200	2.0	0	0.0
20	1,500	1.4	0	0.0
21	0	0.0	30	0.4
Total	108,300	100.0	8,369	100.0
		Reach B		
1	0	0.0	33	0.3
2	0	0.0	20	0.2
3	0	0.0	0	0.0
4	0	0.0	0	0.0
5	0	0.0	30	0.3
6	0	0.0	310	3.0
7	30,500	28.4	2,310	22.9
8	16,200	15.1	2,223	22.0
9	6,500	6.0	297	2.9
10	16,700	15.5	1,057	10.5
11	17,600	16.4	1,553	15.4
12	12,200	11.3	1,390	13.8
13	7,800	7.3	880	8.7
Total	107,500	100.0	10,103	100.0

(Continued)

Table 1 (Continued)

Section	Prototype		Model	
	Average Annual Shoaling Rate cu yd	Percent of Total	Volume Retrieved (Plastic), cc	Percent of Total Recovered
		Reach C		
1	3,800	2.2	687	4.0
2	2,500	1.5	470	2.7
3	6,700	3.9	693	4.0
4	8,900	5.2	1,093	6.3
5	19,200	11.3	2,113	12.2
6	12,400	7.3	1,043	6.0
7	9,400	5.5	647	3.7
8	8,900	5.2	1,503	8.7
9	9,000	5.3	470	2.7
10	9,200	5.4	353	2.0
11	9,400	5.5	1,477	8.6
12	8,700	5.1	330	1.9
13	8,800	5.2	957	5.5
14	5,900	3.5	153	0.9
15	7,300	4.3	710	4.1
16	8,200	4.8	700	4.1
17	7,000	4.1	970	5.6
18	6,900	4.0	667	3.9
19	7,900	4.6	673	3.9
20	6,200	3.6	1,340	7.8
21	4,200	2.5	240	1.4
Total	170,500	100.0	17,289	100.0
		Reach D		
1	1,800	2.4	233	3.7
2	4,500	6.1	617	9.8
3	6,100	8.3	537	8.5
4	6,000	8.2	770	12.2
5	10,400	14.2	943	15.0
6	10,900	14.9	983	15.6
7	7,800	10.7	450	7.1
8	7,600	10.4	460	7.3
9	7,800	10.6	803	12.7
10	6,300	8.6	377	6.0
11	4,100	5.6	133	2.1
Total	73,300	100.0	6,306	100.0

(Continued)

Table 1 (Continued)

Section	Prototype: Average Annual Shoaling Rate cu yd	Prototype: Percent of Total	Model: Volume Retrieved (Plastic), cc	Model: Percent of Total Recovered
		Reach E		
1	900	0.9	3	0.0
2	4,400	4.3	243	2.6
3	34,300	33.5	2,447	26.5
4	16,200	15.9	1,860	20.2
5	700	0.7	120	1.3
6	300	0.3	397	4.3
7	13,300	13.0	1,313	14.2
8	13,400	13.1	643	7.0
9	900	0.9	257	2.8
10	3,200	3.1	337	3.7
11	3,400	3.3	450	4.9
12	2,200	2.2	350	3.8
13	2,100	2.1	473	5.1
14	800	0.8	43	0.5
15	2,300	2.2	47	0.5
16	3,800	3.7	237	2.6
Total	102,200	100.0	9,220	100.0
		Reach F		
1	3,100	9.4	487	13.3
2	3,100	9.4	473	13.0
3	3,000	9.1	410	11.2
4	3,300	10.0	283	7.8
5	2,900	8.8	433	11.9
6	2,600	7.9	77	2.1
7	3,300	10.0	363	9.9
8	500	1.5	77	2.1
9	0	0.0	113	3.1
10	5,200	15.8	753	20.6
11	2,500	7.6	153	4.2
12	1,200	3.7	10	0.3
13	1,200	3.7	10	0.3
14	1,000	3.1	7	0.2
Total	32,900	100.0	3,649	100.0

(Continued)

Table 1 (Continued)

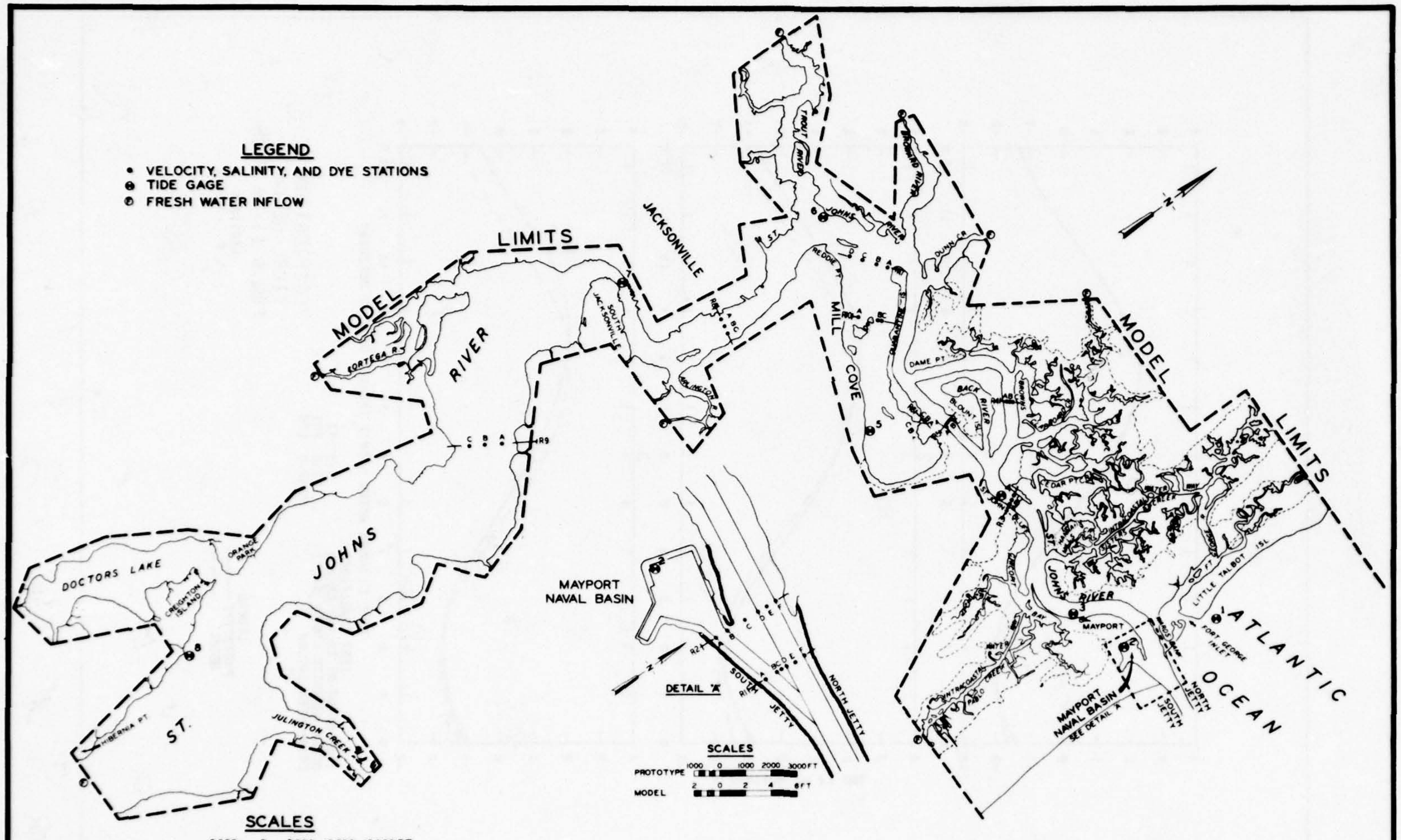
Section	Prototype: Average Annual Shoaling Rate cu yd	Prototype: Percent of Total	Model: Volume Retrieved (Plastic), cc	Model: Percent of Total Recovered
		Reach G		
1	167	5.6	13	1.3
2	167	5.6	20	2.0
3	167	5.6	80	8.1
4	167	5.6	143	14.4
5	167	5.6	107	10.8
6	167	5.6	80	8.1
7	167	5.6	83	8.4
8	167	5.6	57	5.8
9	167	5.6	33	3.3
10	167	5.6	53	5.4
11	167	5.6	37	3.7
12	167	5.6	47	4.7
13	167	5.6	37	3.7
14	167	5.6	50	5.0
15	167	5.6	57	5.8
16	167	5.6	67	6.8
17	167	5.6	17	1.7
18	161	4.8	10	1.0
Total	3,000	100.0	991	100.0
		Reach H		
1	16,500	15.6	1,237	18.0
2	22,000	20.9	1,910	27.8
3	3,000	2.8	320	4.6
4	3,100	2.9	390	5.7
5	3,300	3.1	340	4.9
6	14,500	13.8	857	12.5
7	43,100	40.9	1,820	26.5
Total	105,500	100.0	6,874	100.0

(Continued)

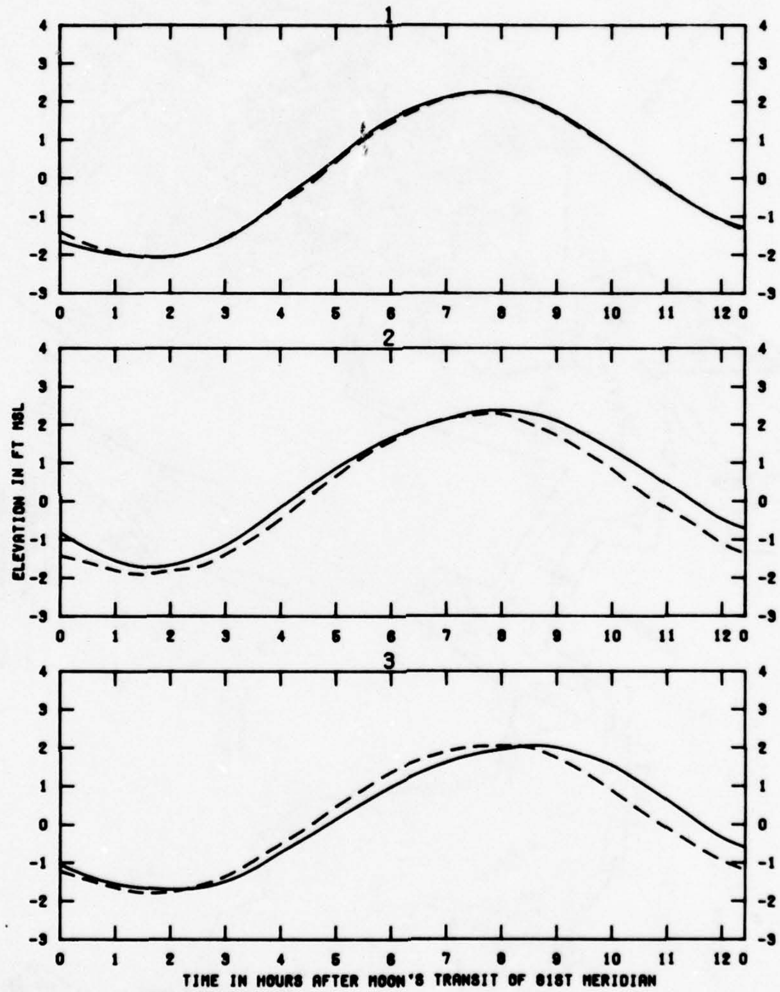
Table 1 (Concluded)

Reach	Prototype: Average Annual Shoaling Rate cu yd	Prototype: Percent of Total	Model: Volume Retrieved (Plastic), cc	Model: Percent of Total Recovered
	Summary by Reaches			
A	108,300	15.4	8,369	13.3
B	107,500	15.3	10,103	16.1
C	170,500	24.3	17,289	27.5
D	73,300	10.4	6,306	10.0
E	102,200	14.5	9,220	14.7
F	32,900	4.7	3,649	5.8
G	3,000	0.4	991	1.6
H	105,500	15.0	6,874	11.0
Total	703,200	100.0	62,801	100.0

Section	Prototype: Average Annual Shoaling Rate cu yd	Prototype: Percent of Total	Model: Volume Retrieved (Gilsonite), cc*	Model: Percent of Total Recovered
	Mayport Basin			
Entrance Channel	74,400	18.4	540	21.7
NE	65,900	16.3	627	25.2
SE	88,100	21.8	523	21.1
SW	74,700	18.5	327	13.2
NW	94,400	23.3	318	12.8
Slip	7,000	1.7	148	6.0
Total	404,500	100.0	2,483	100.0



MODEL LIMITS AND PROTOTYPE STATION LOCATIONS



TEST CONDITIONS

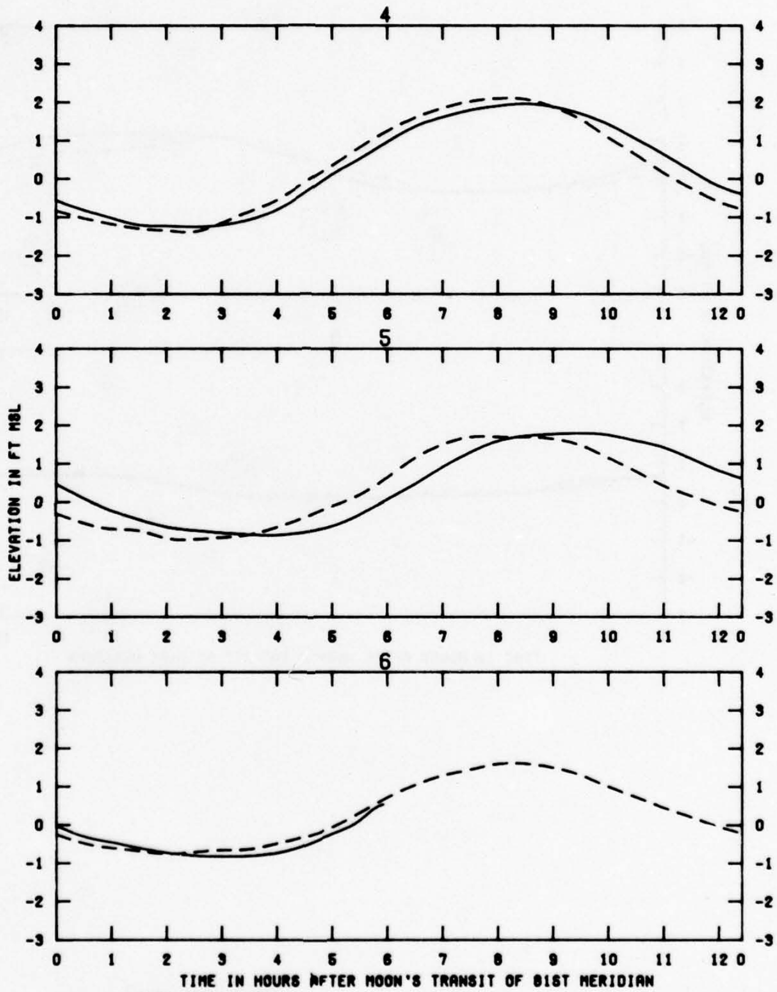
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
TIDAL HEIGHTS
FOR 6-11-74 TIDE

STATIONS
1 , 2 , AND 3

PLATE 2



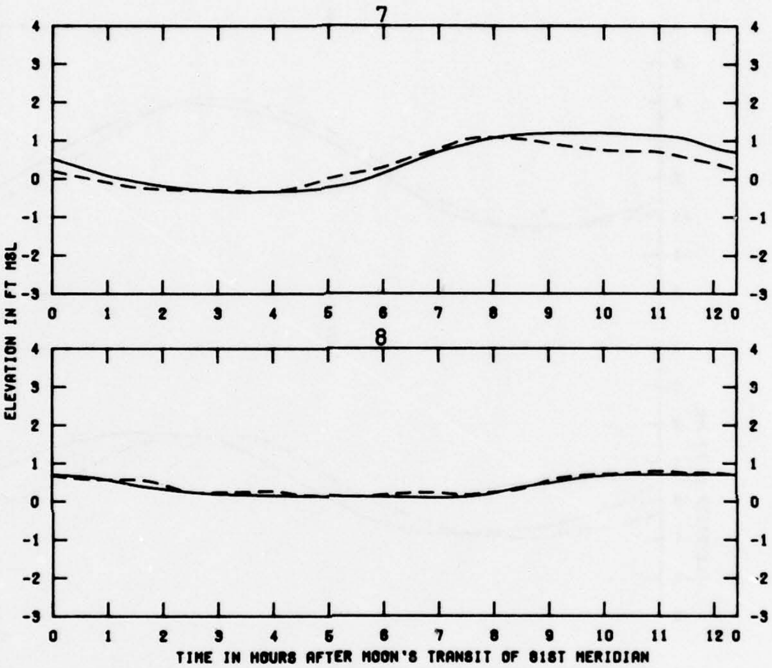
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
TIDAL HEIGHTS
FOR 6-11-74 TIDE

STATIONS
4 , 5 , AND 6



TEST CONDITIONS

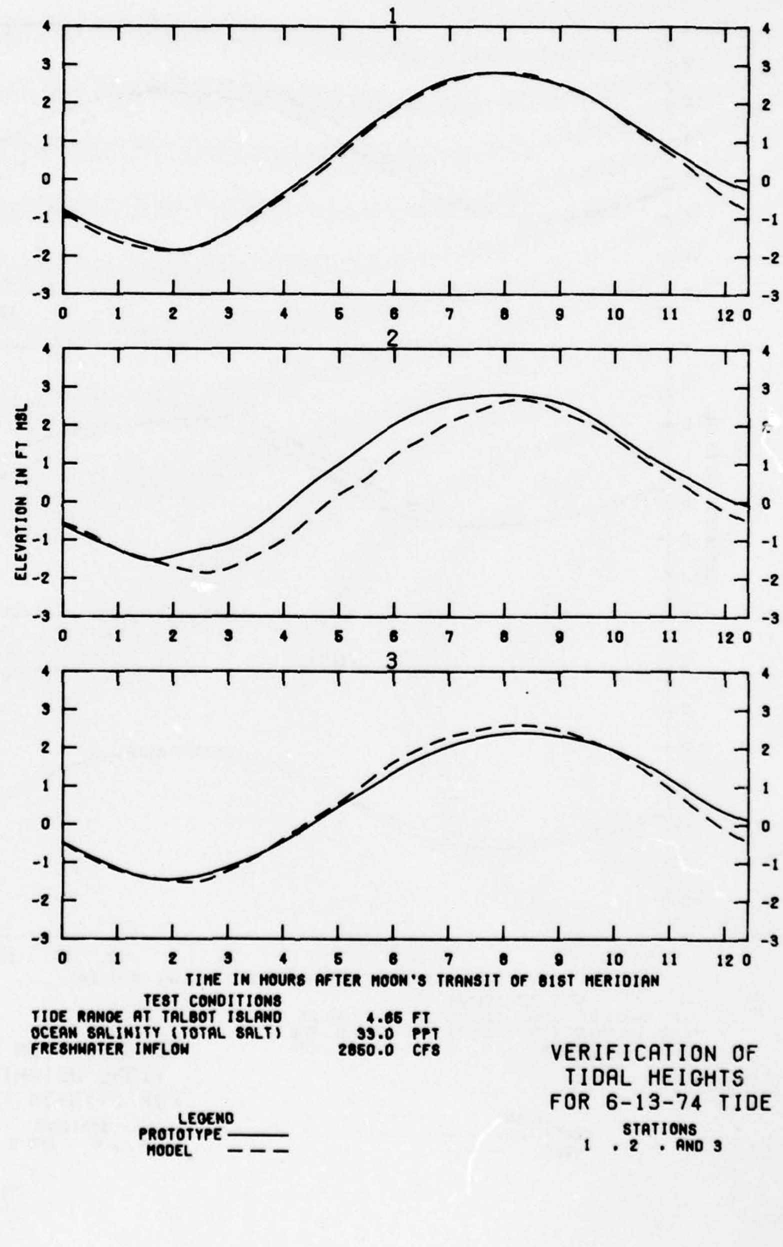
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF TIDAL HEIGHTS FOR 6-11-74 TIDE

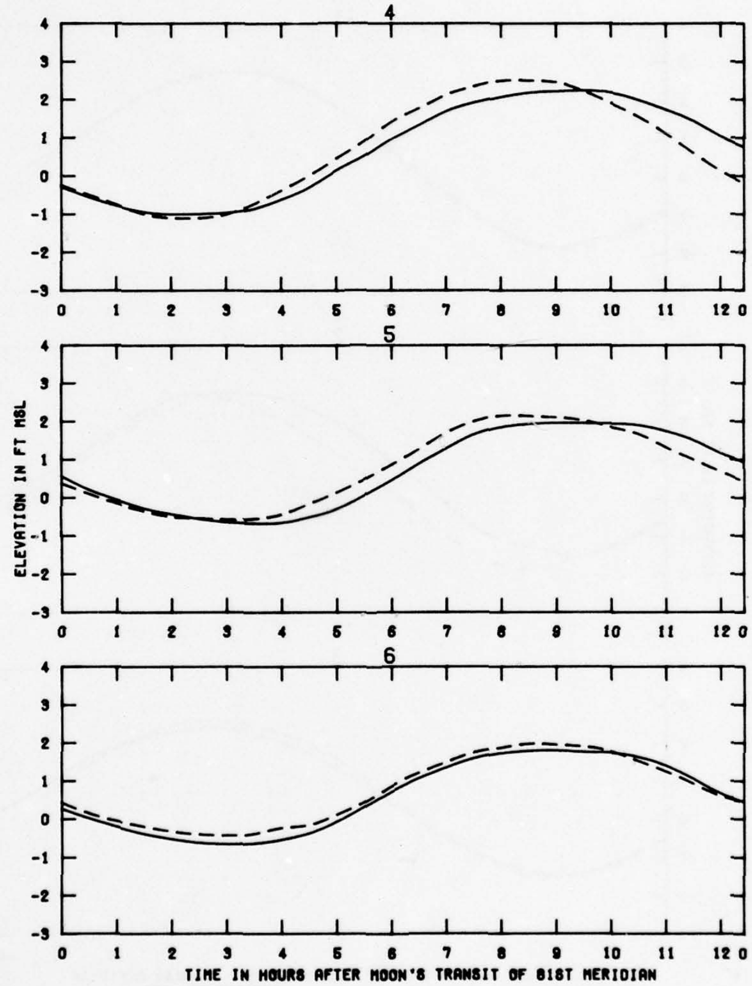
STATIONS 7 AND 8

PLATE 4



VERIFICATION OF
TIDAL HEIGHTS
FOR 6-13-74 TIDE

STATIONS
1 , 2 , AND 3



TEST CONDITIONS

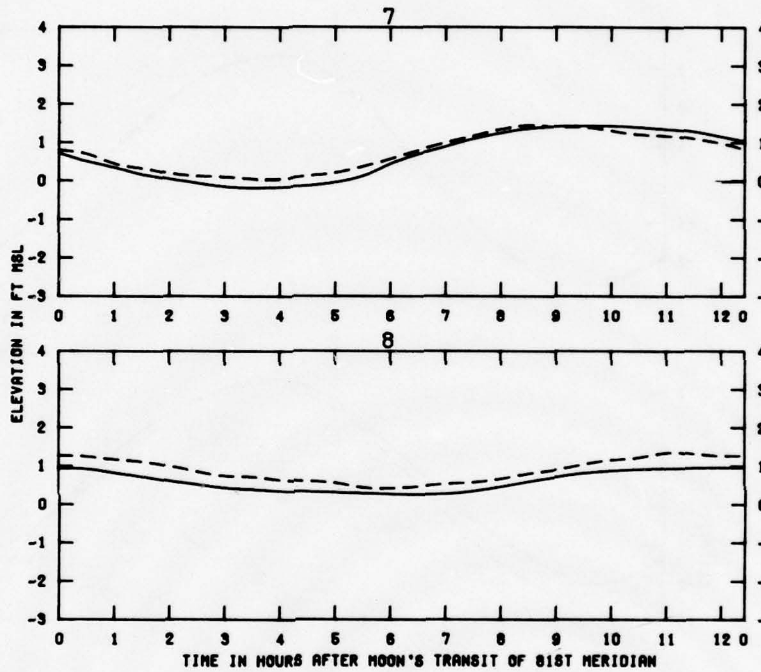
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
TIDAL HEIGHTS
FOR 6-13-74 TIDE

STATIONS
4 , 5 , AND 6

PLATE 6



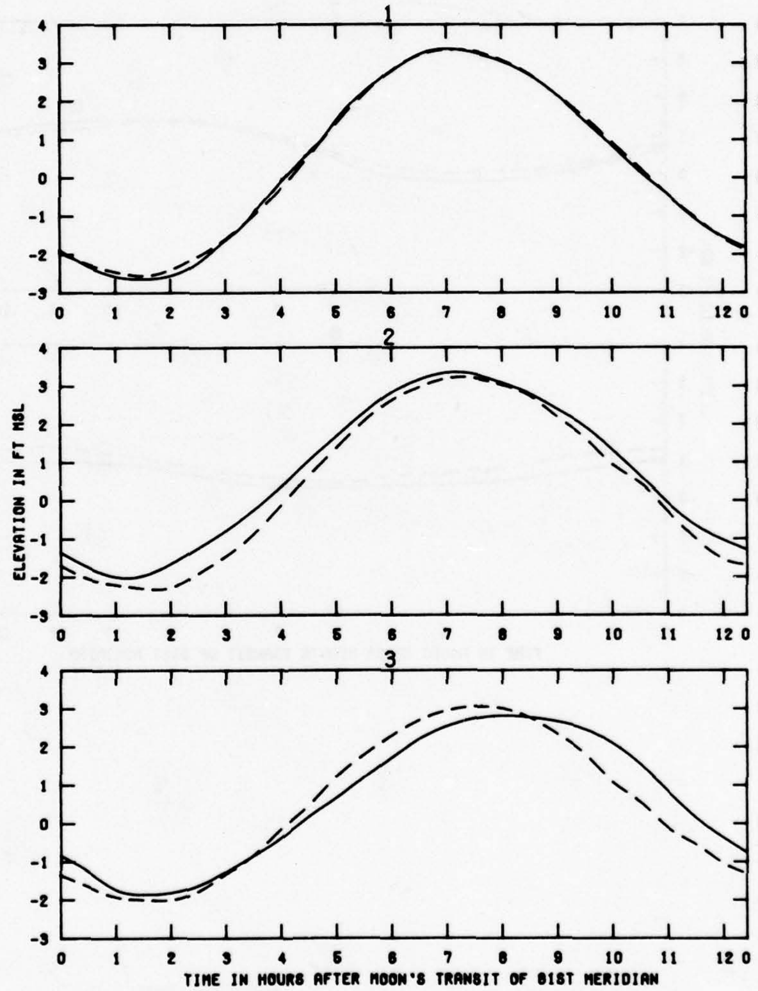
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
TIDAL HEIGHTS
FOR 6-13-74 TIDE

STATIONS
7 AND 8



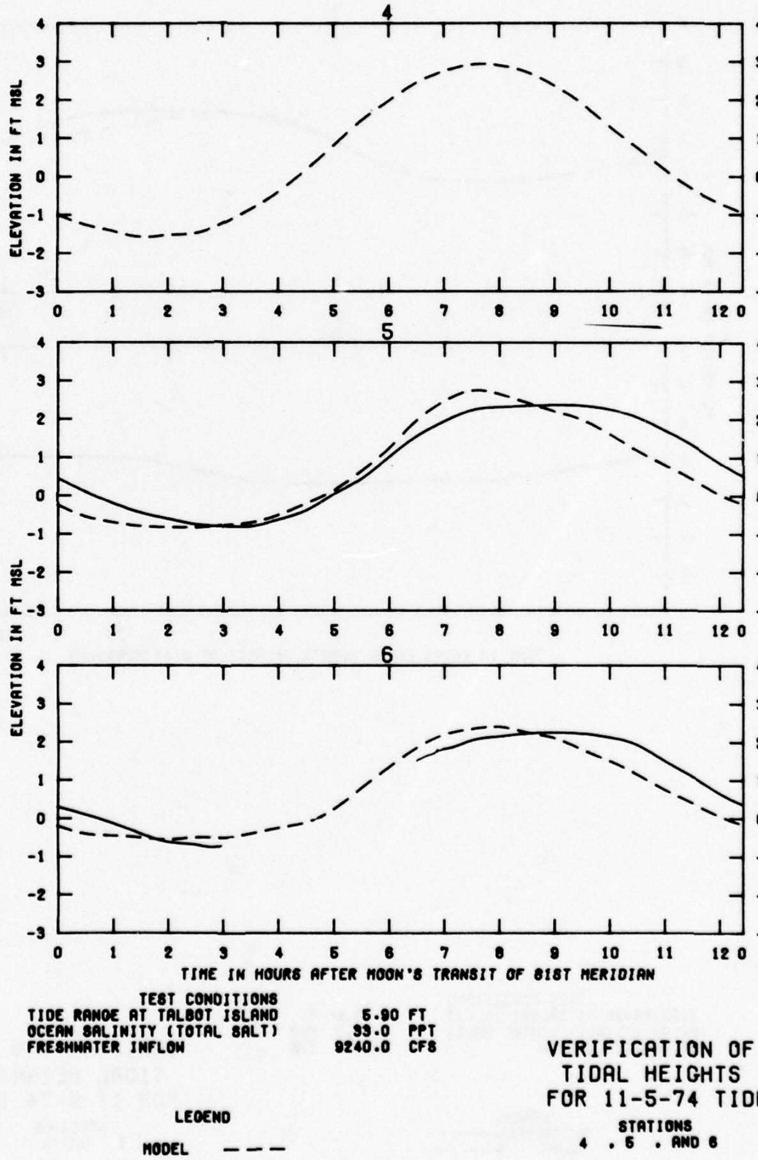
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

VERIFICATION OF TIDAL HEIGHTS FOR 11-5-74 TIDE

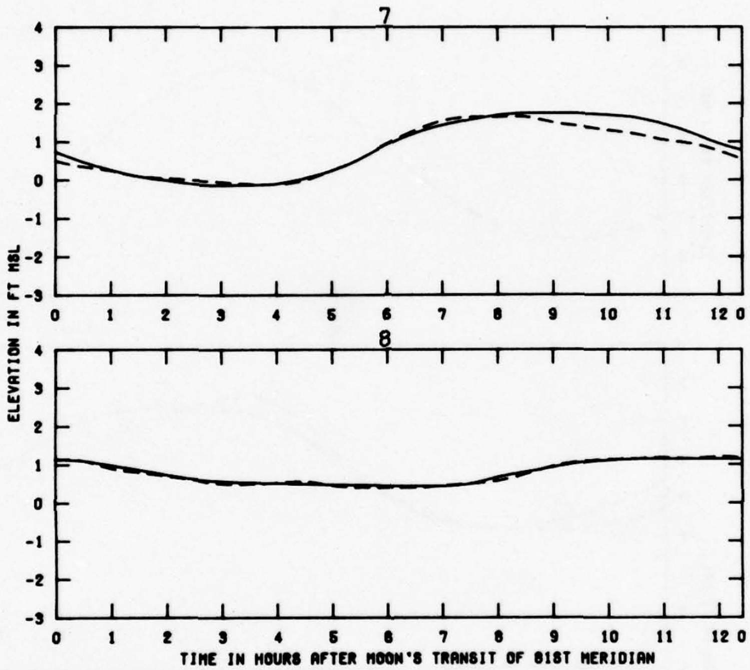
STATIONS 1 . 2 . AND 3

PLATE 8



VERIFICATION OF
TIDAL HEIGHTS
FOR 11-5-74 TIDE

PLATE 9



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
TIDAL HEIGHTS
FOR 11-5-74 TIDE

STATIONS
7 AND 8

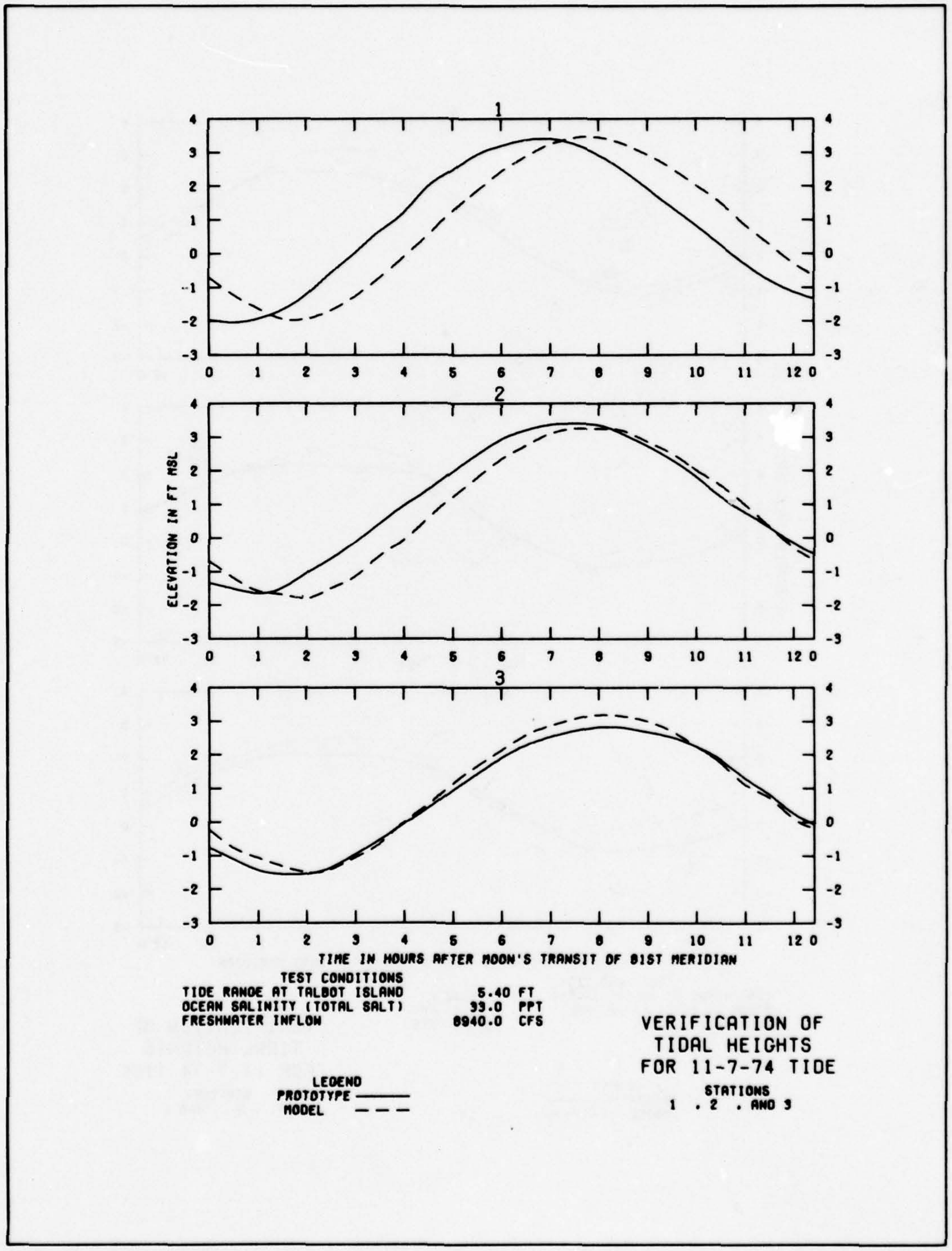
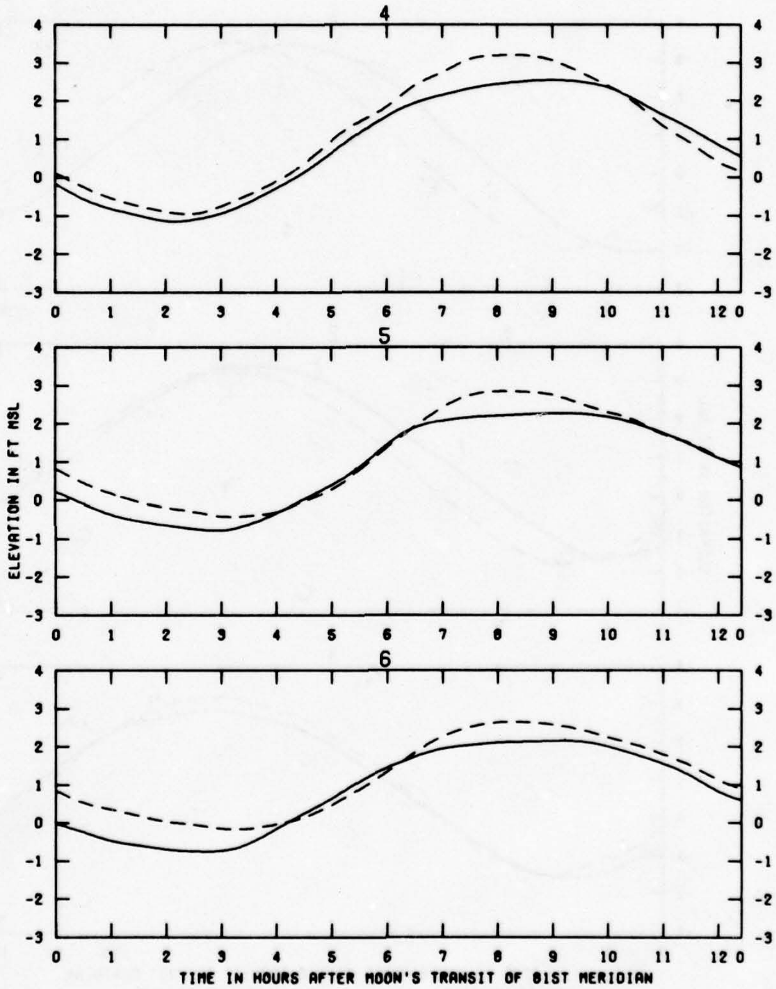

1
2
3
ELEVATION IN FT MSL
4
3
2
1
0
-1
-2
-3
0 1 2 3 4 5 6 7 8 9 10 11 12 0
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 5.40 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
TIDAL HEIGHTS
FOR 11-7-74 TIDE
STATIONS
1 . 2 . AND 3

PLATE 11



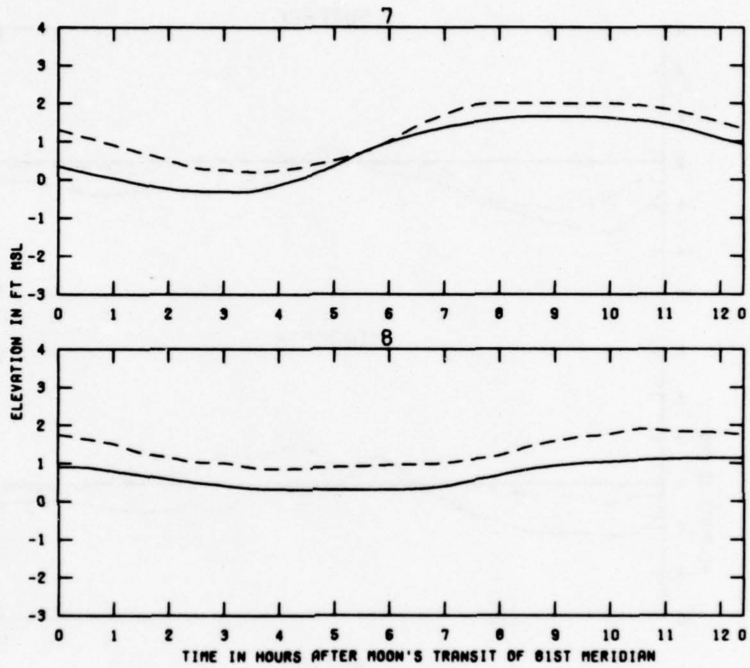
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 5.40 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
PROTOTYPE ——
MODEL – – –

VERIFICATION OF TIDAL HEIGHTS FOR 11-7-74 TIDE

STATIONS 4 . 5 . AND 6

PLATE 12



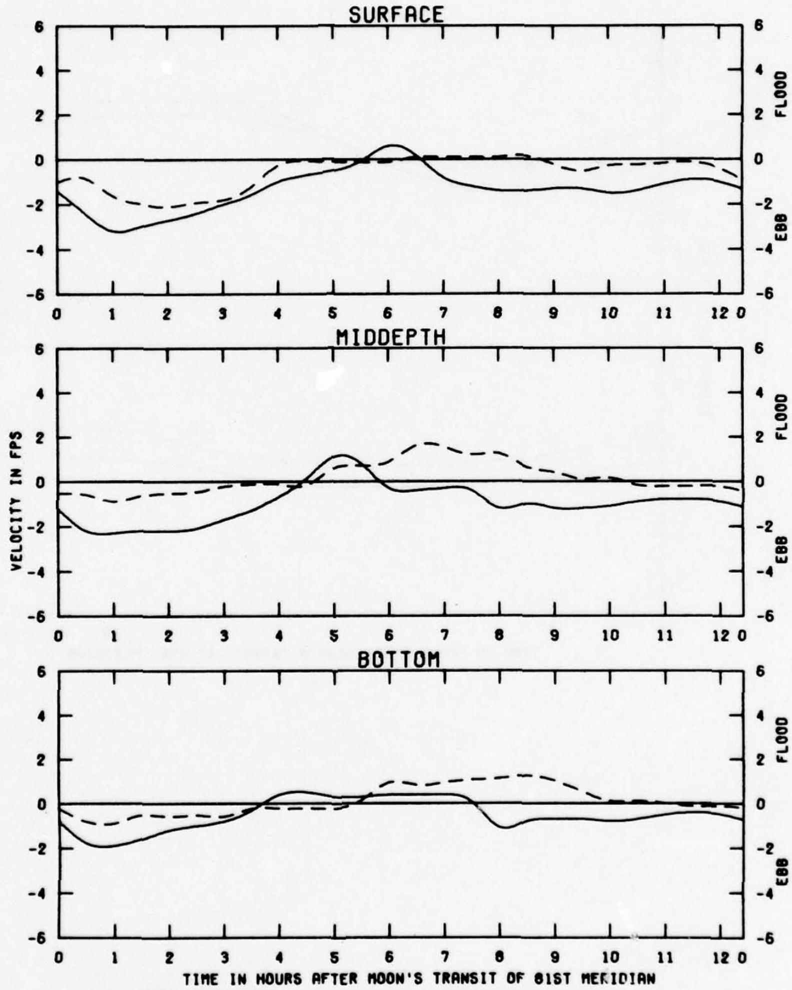
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
TIDAL HEIGHTS
FOR 11-7-74 TIDE

STATIONS
7 AND 8



TEST CONDITIONS

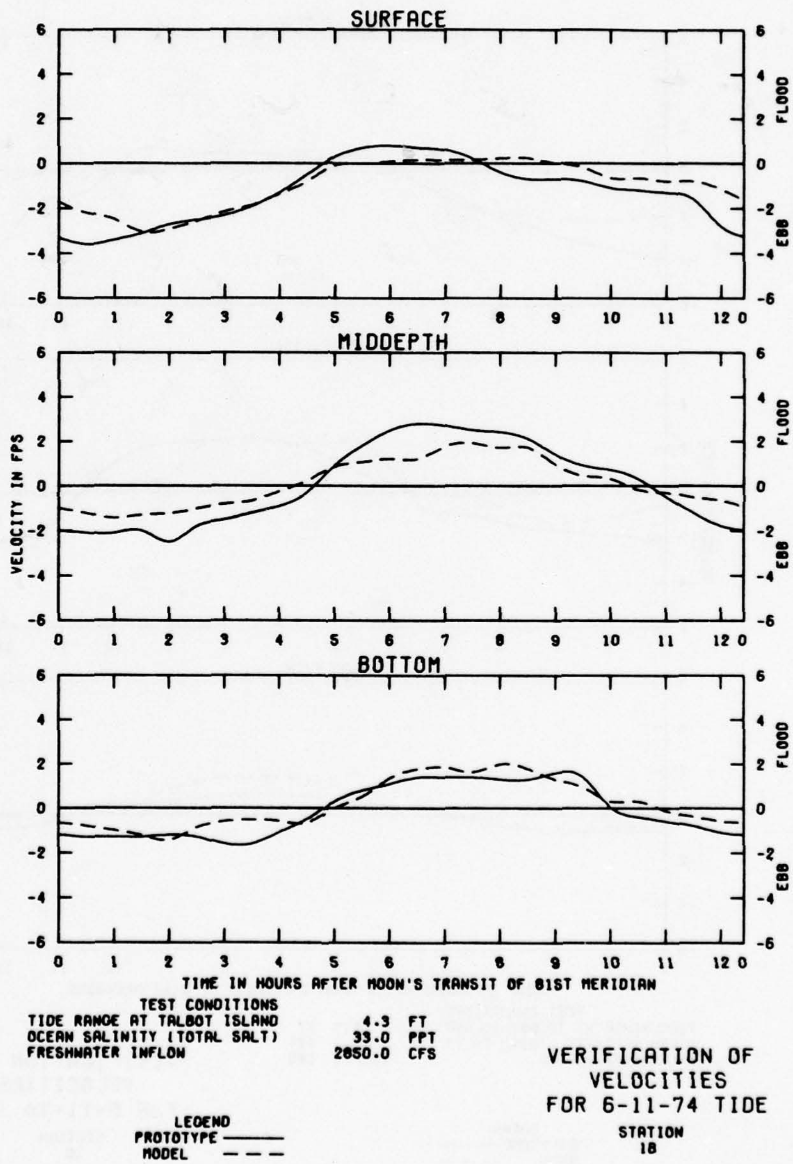
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

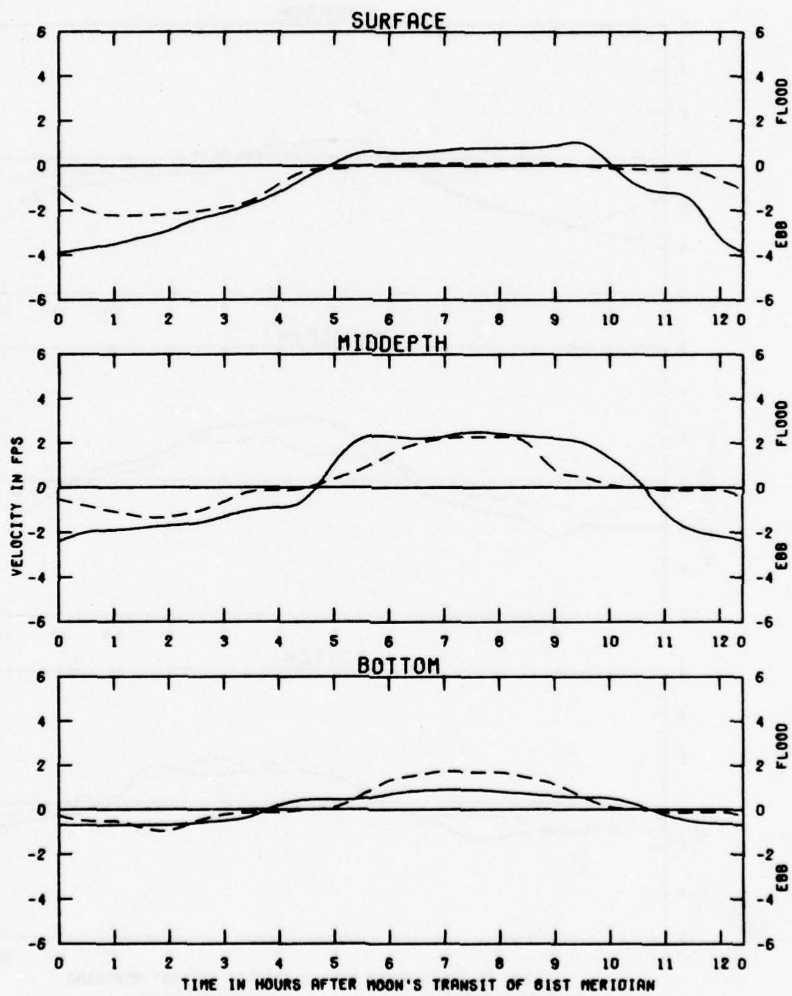
VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
1A

PLATE 14



VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE



TEST CONDITIONS

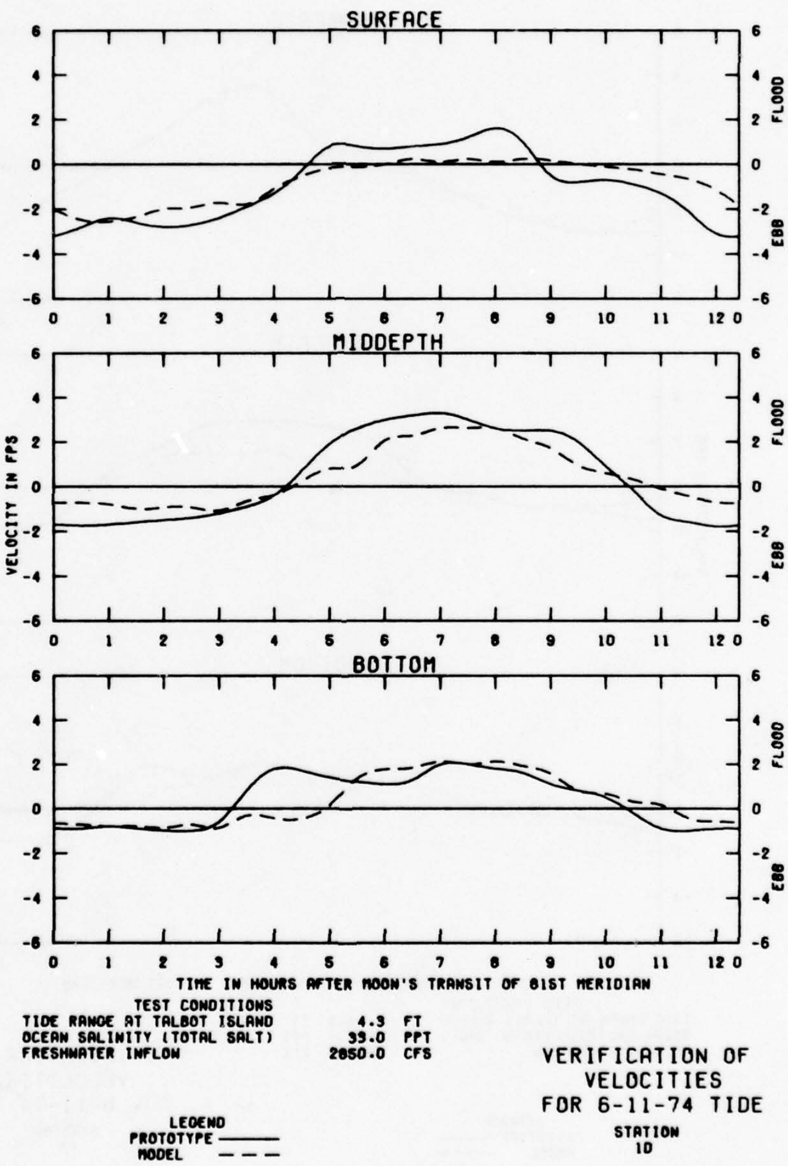
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

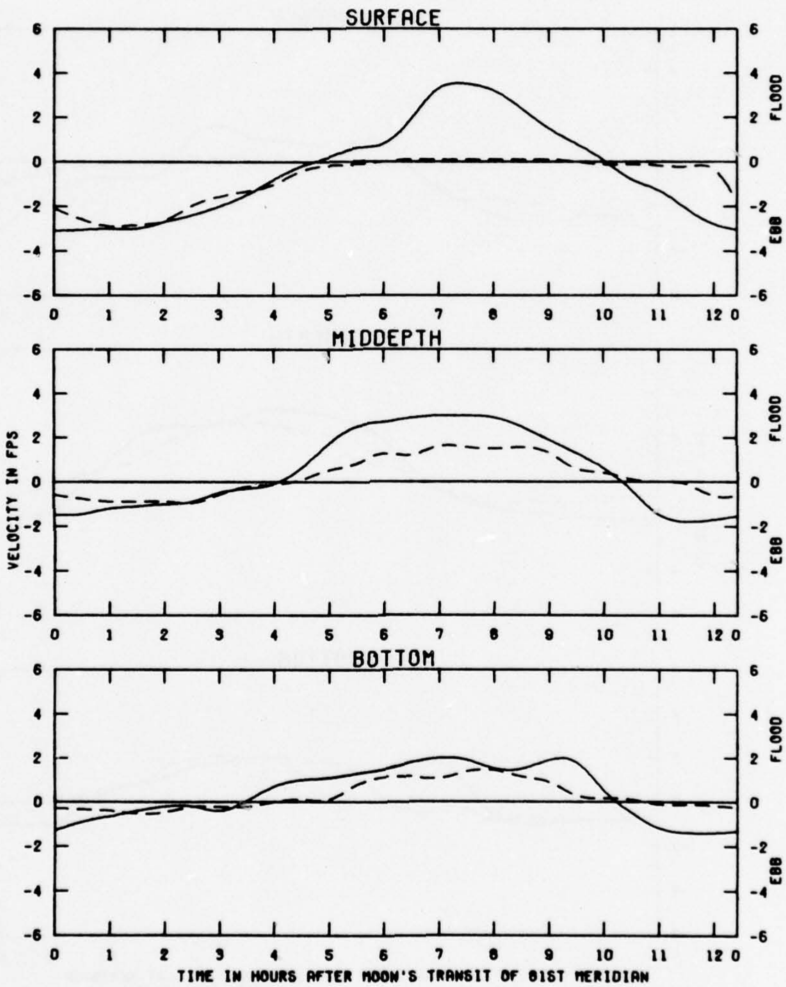
LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 1C

PLATE 16


SURFACE
MIDDEPTH
BOTTOM
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 4.3 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2850.0 CFS
VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE
LEGEND
PROTOTYPE
MODEL
STATION
10



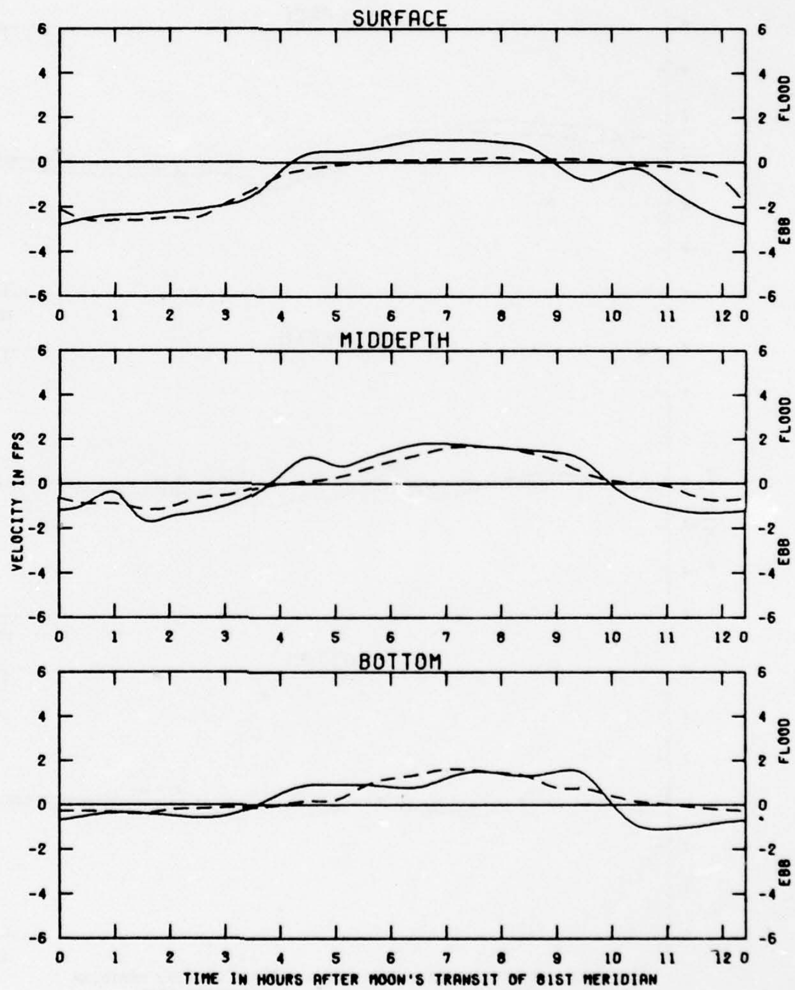
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
1E



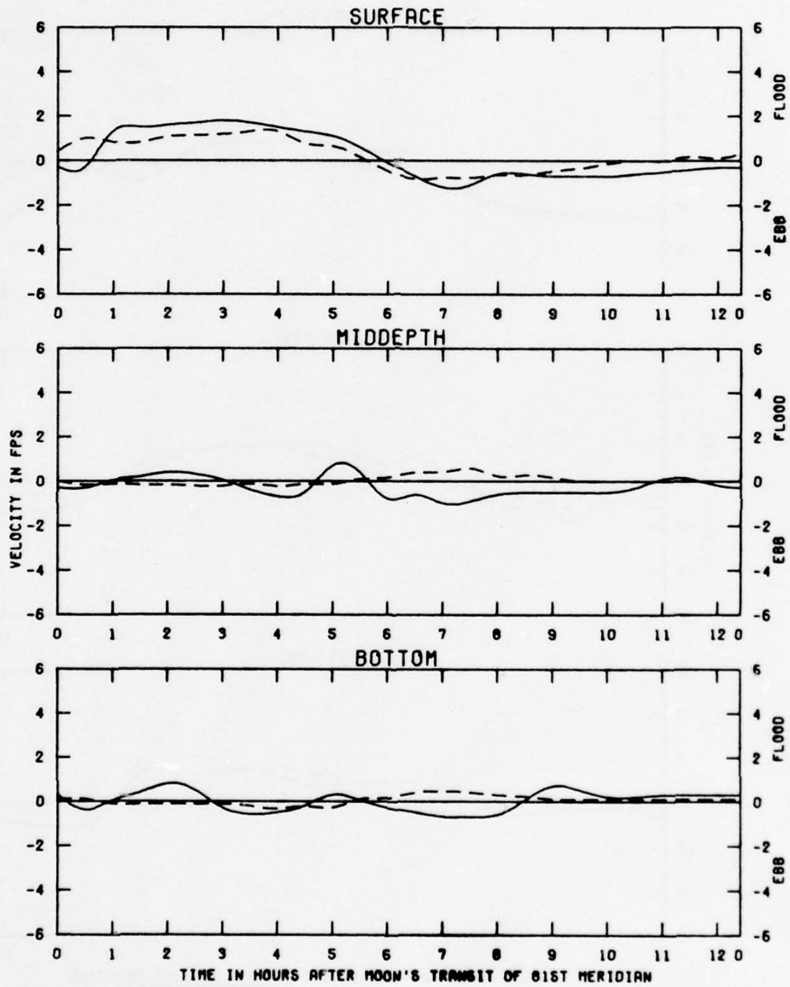
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 1F



TEST CONDITIONS

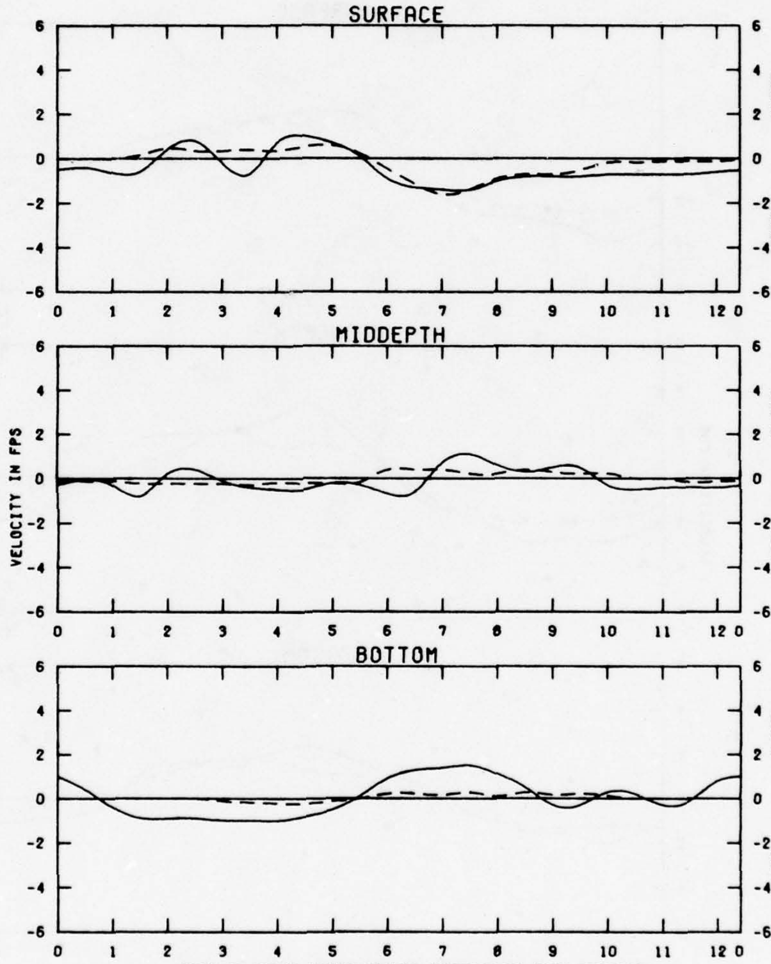
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
2A

PLATE 20



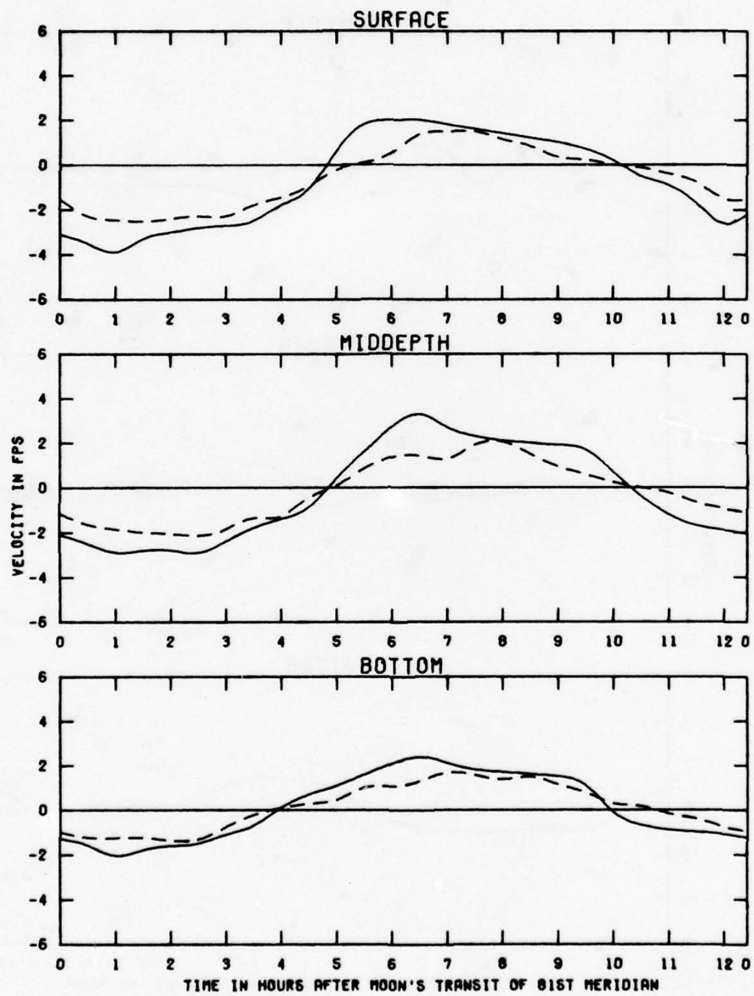
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
28



TEST CONDITIONS

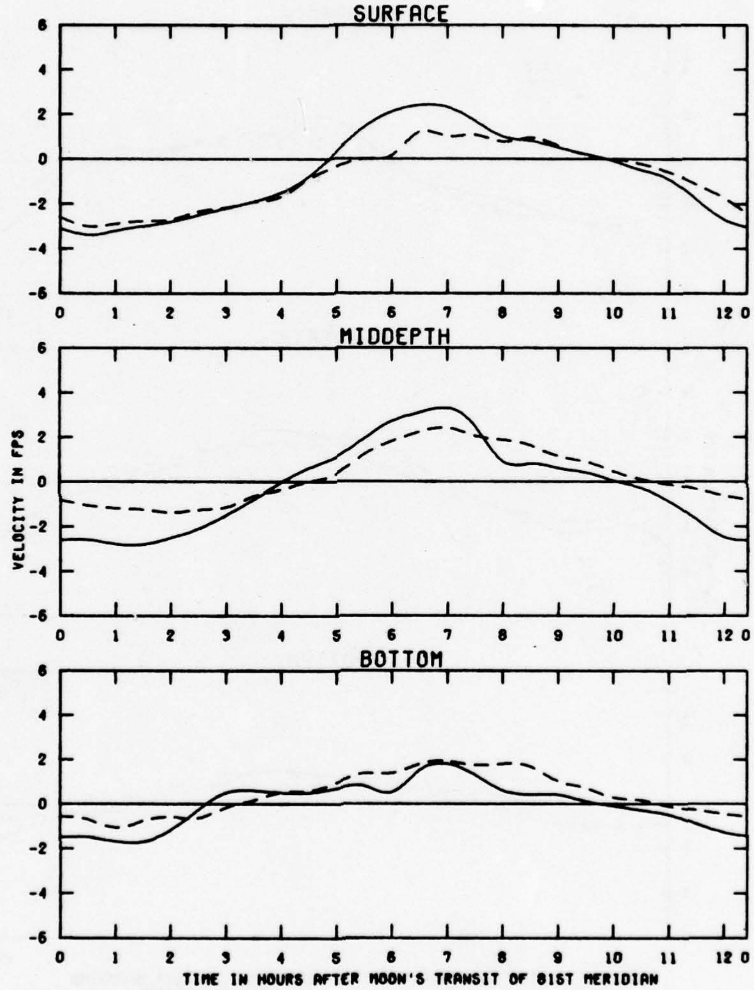
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
2C

PLATE 22



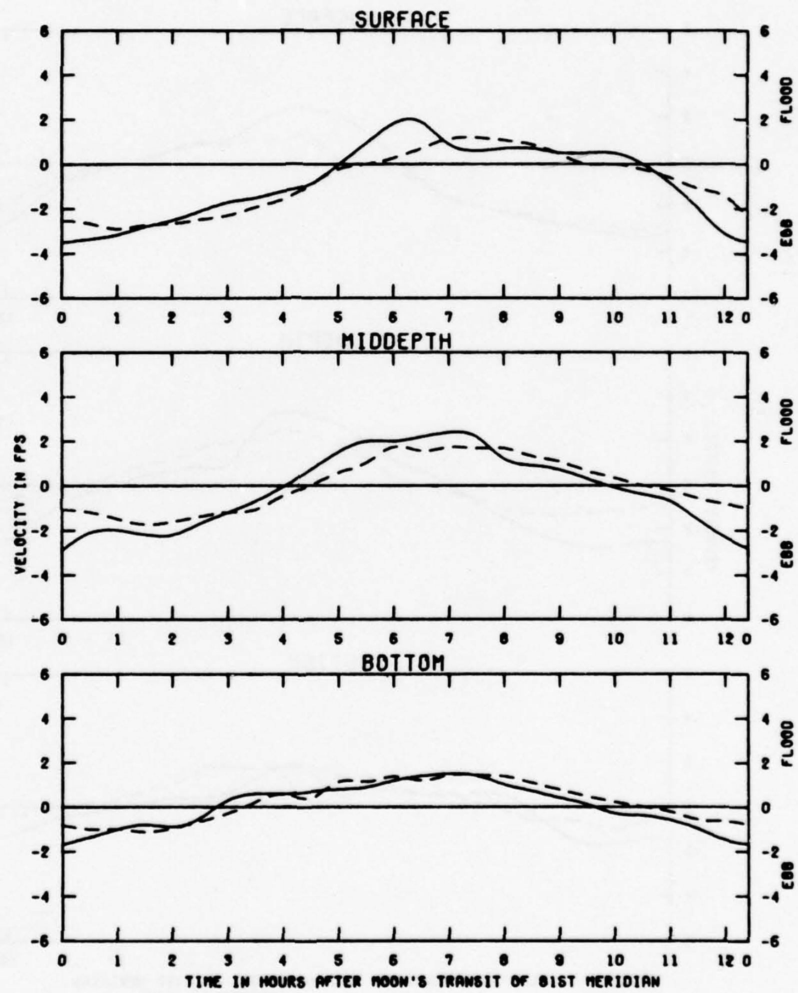
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 2D



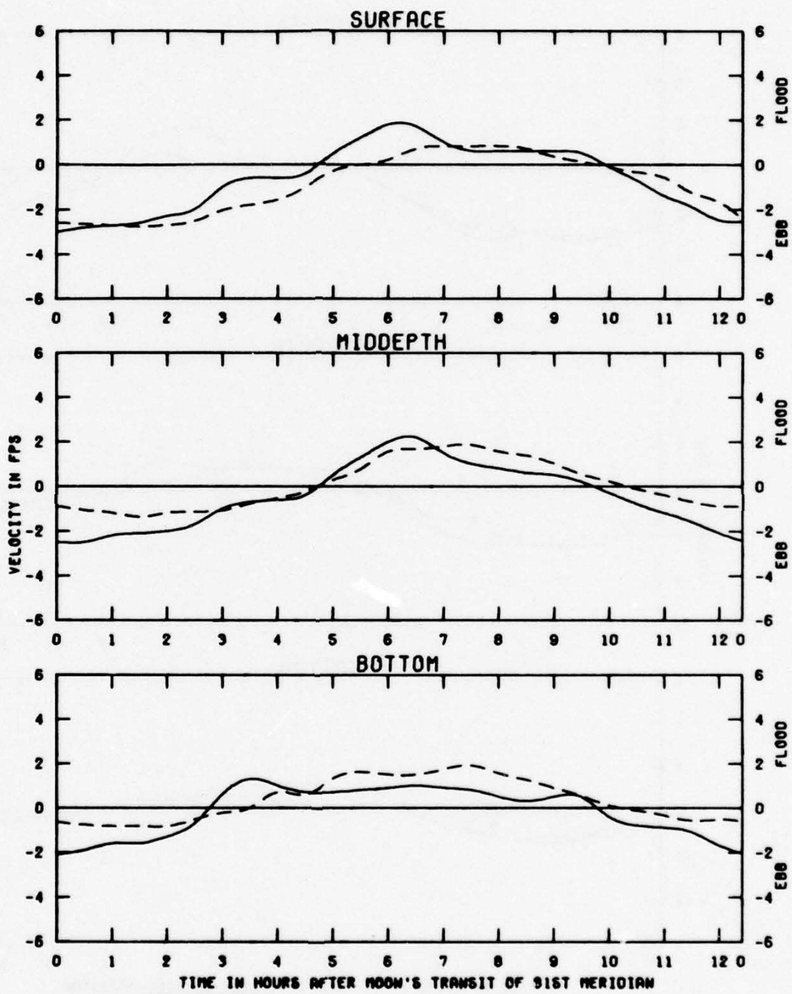
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 2E



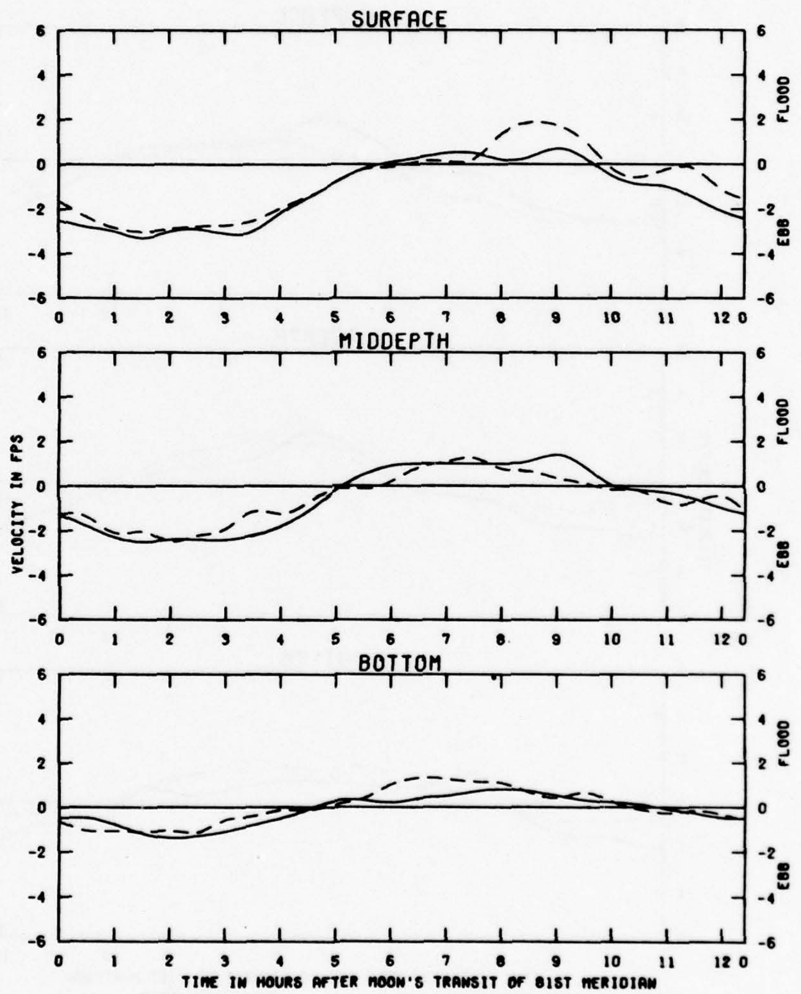
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 2F



TEST CONDITIONS

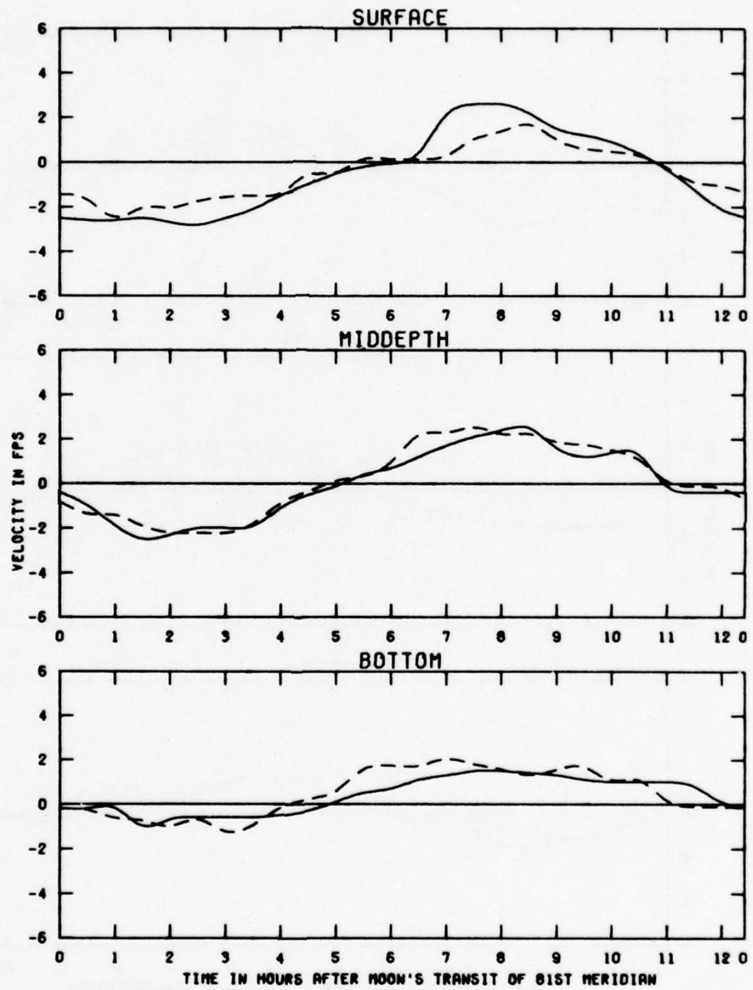
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
3A

PLATE 26



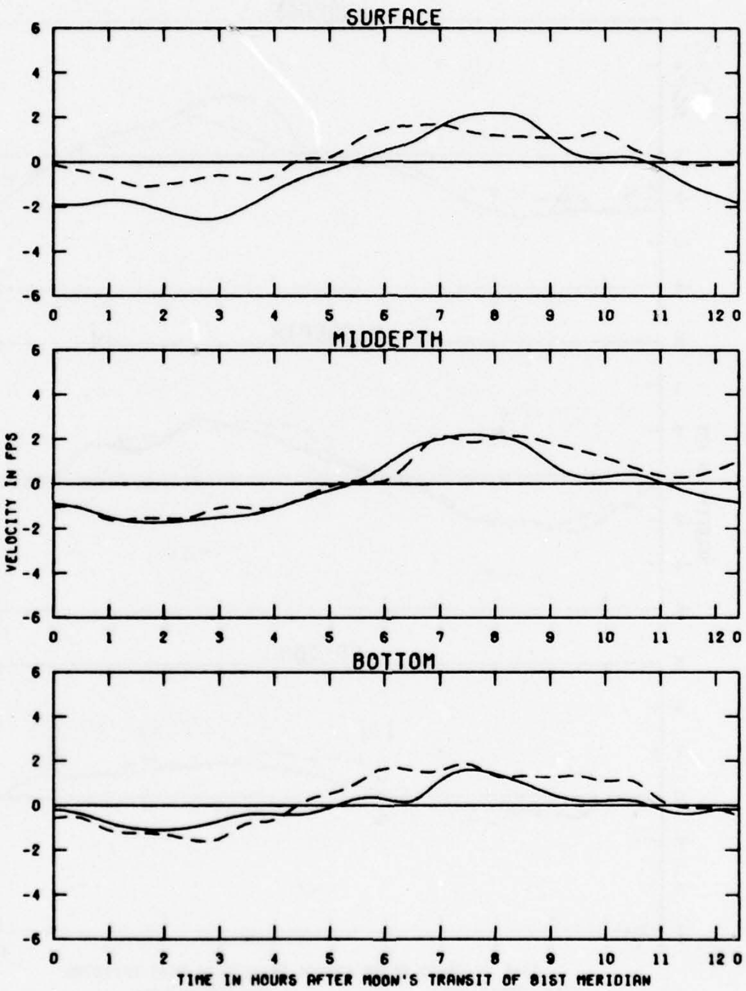
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 38

LEGEND
PROTOTYPE ———
MODEL – – –



TEST CONDITIONS

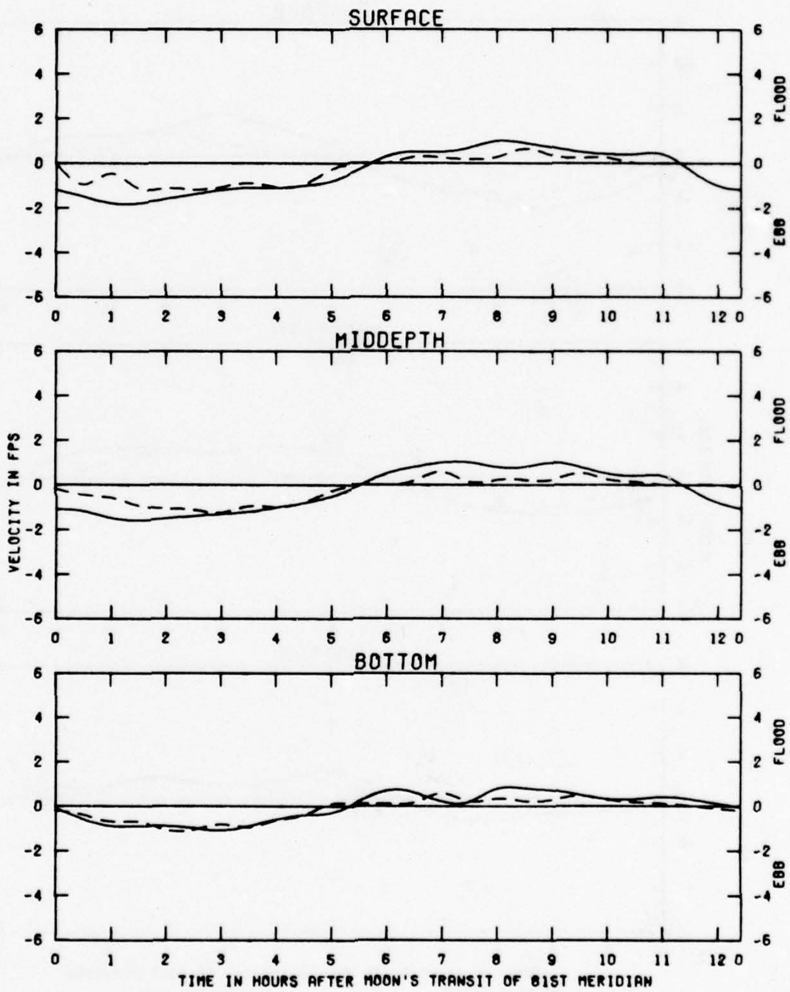
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 3C

PLATE 28



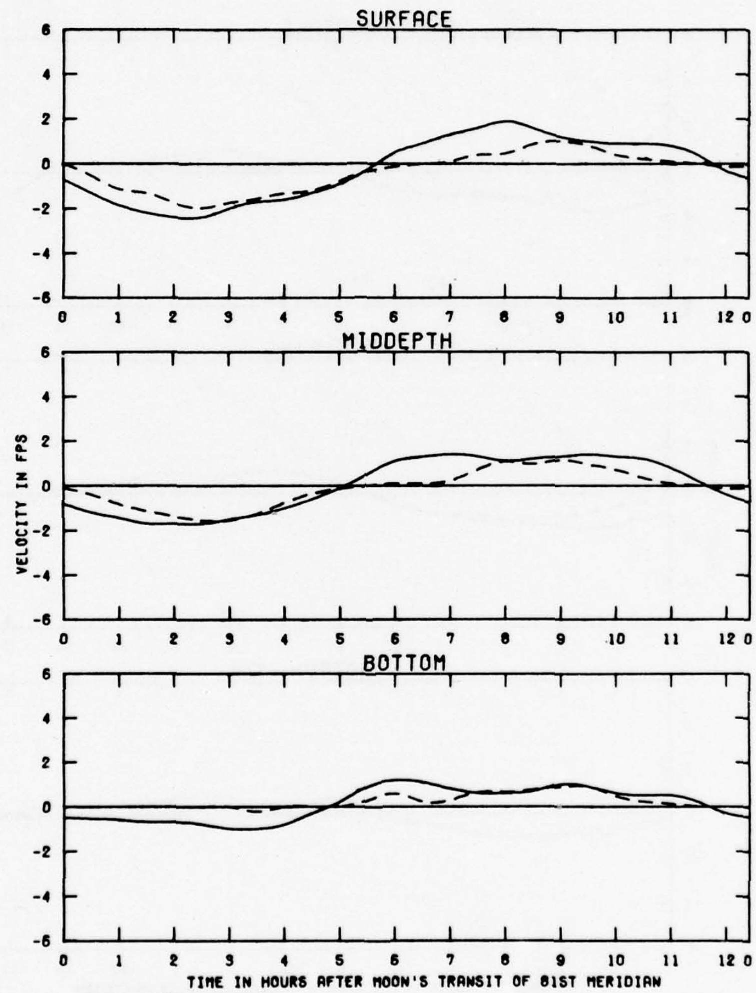
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
4A



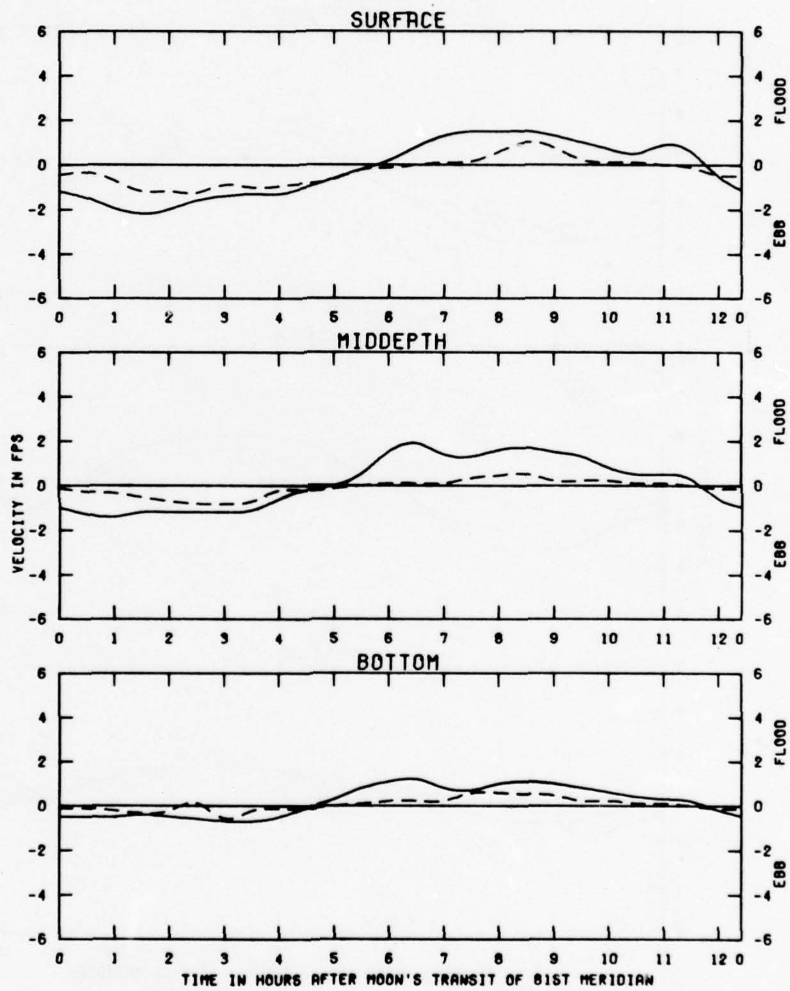
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-11-74 TIDE

STATION 48

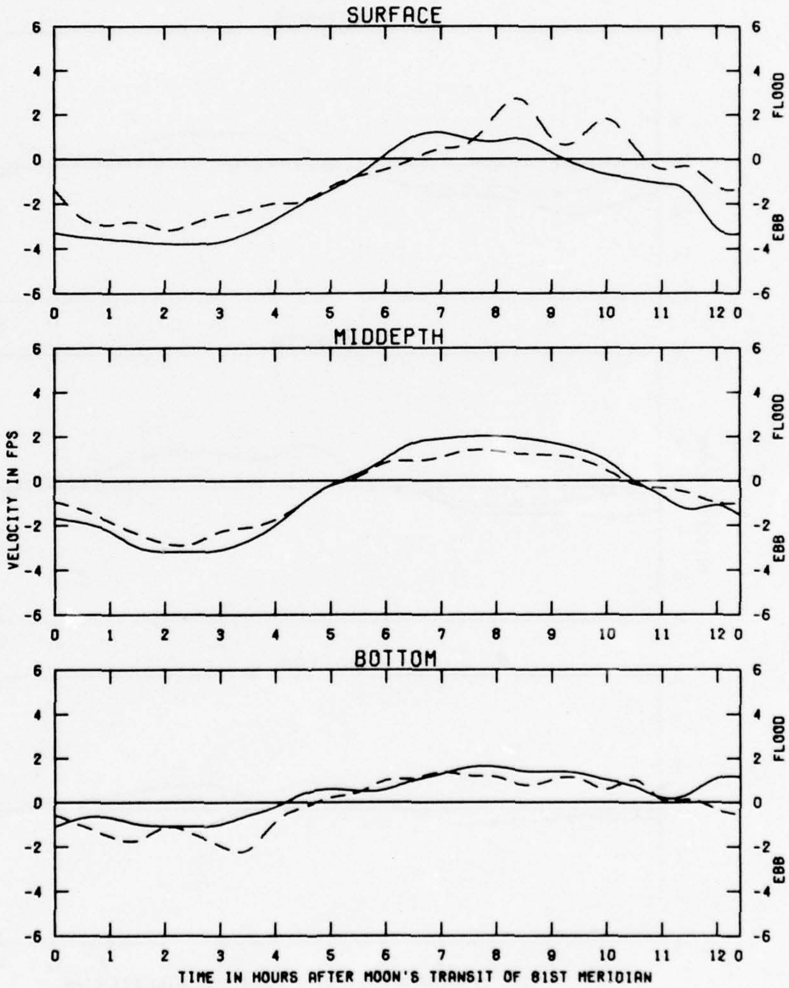


TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-11-74 TIDE

STATION
4C



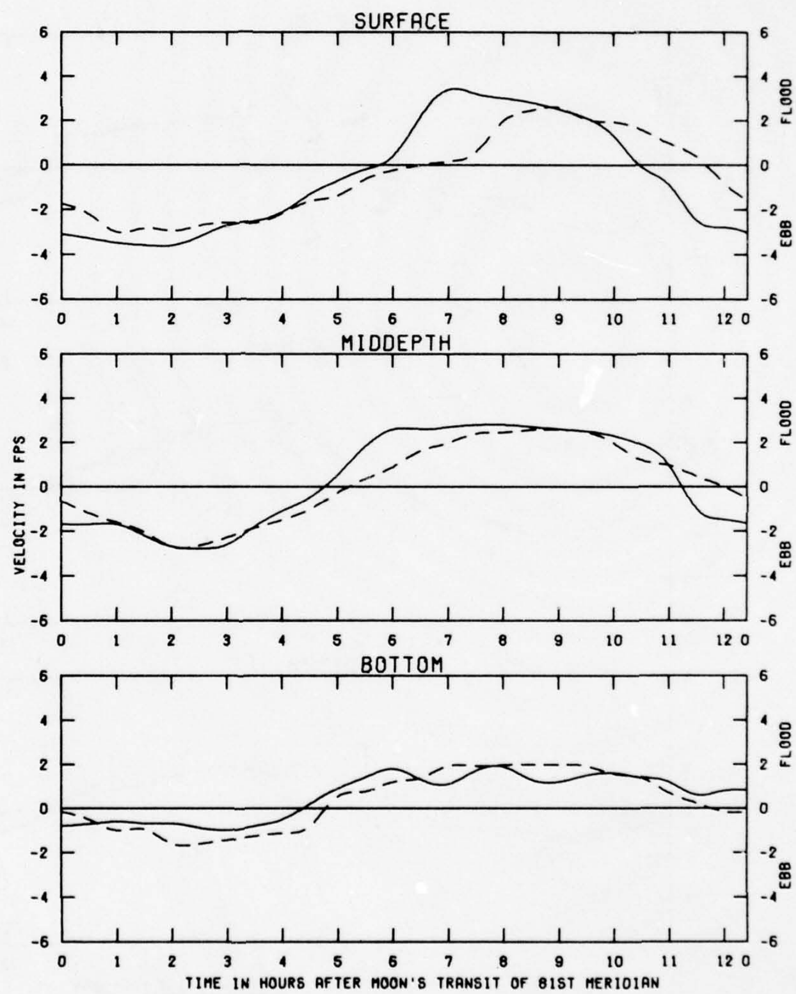
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	2850.0 CFS

LEGEND
PROTOTYPE ————
MODEL — — —

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 3A



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

STATION
38

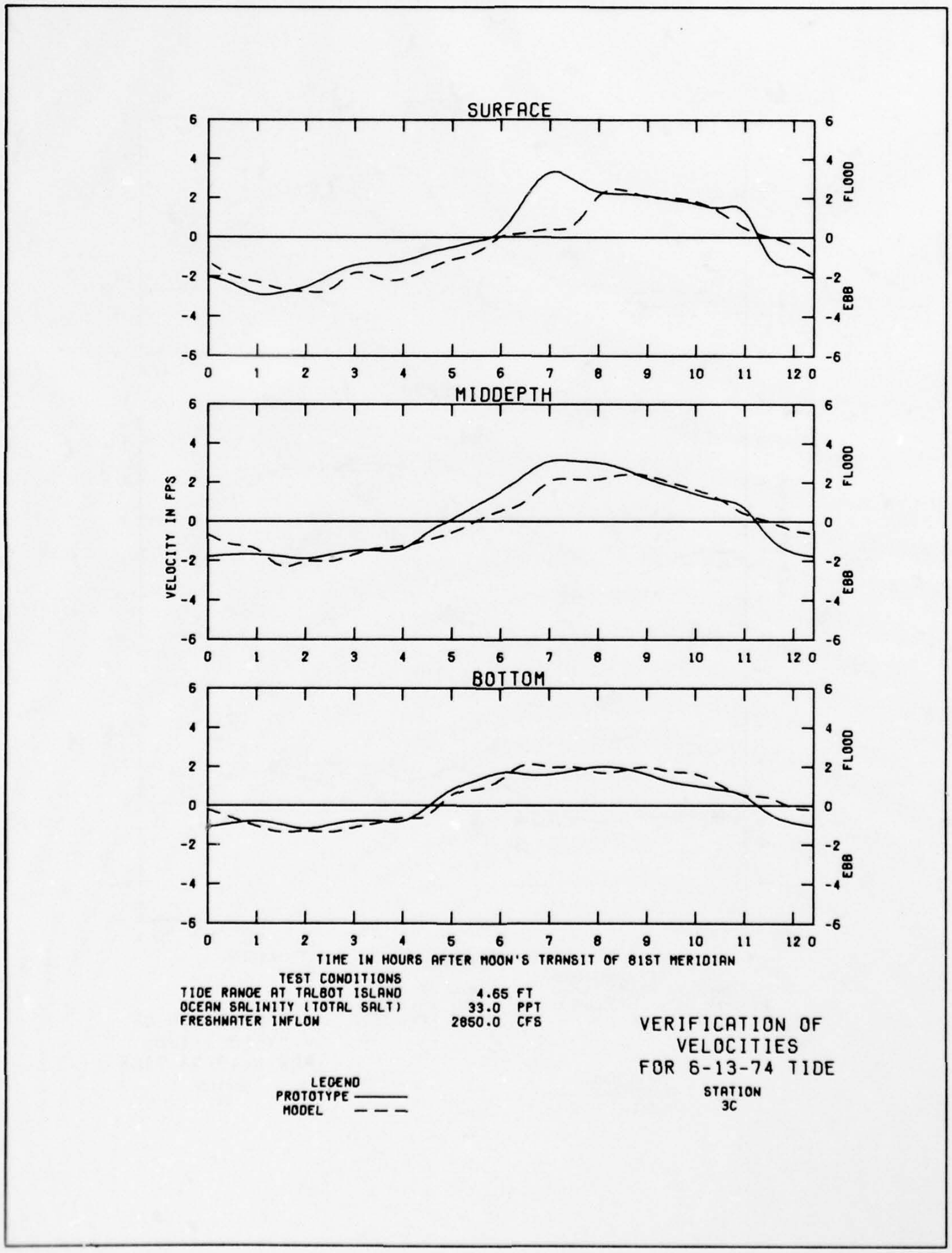
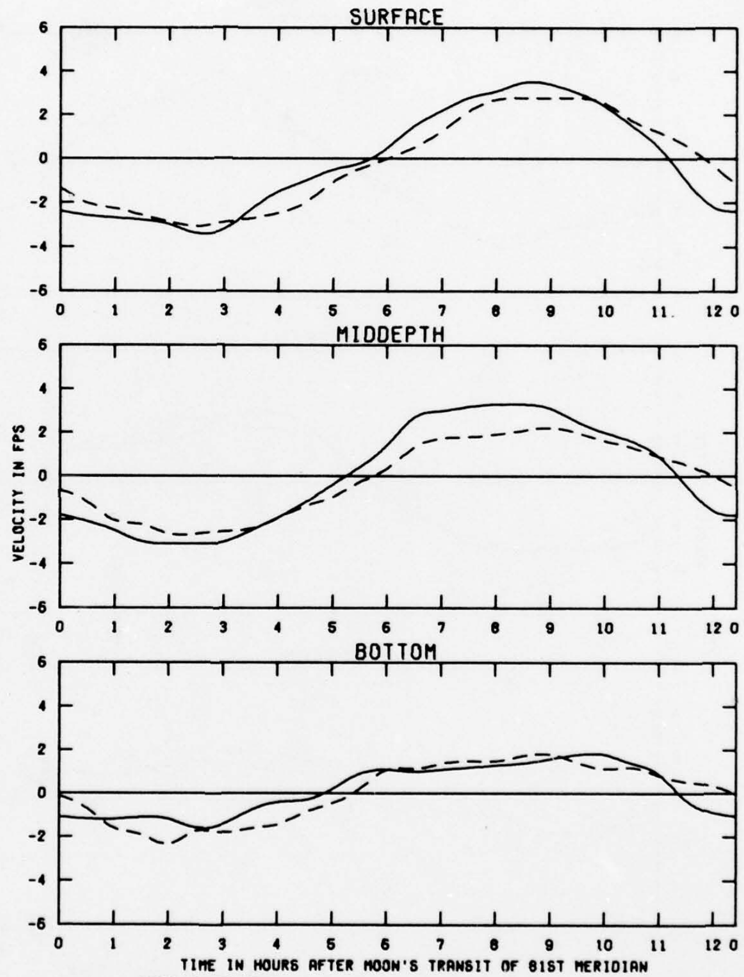

SURFACE
MIDDEPTH
BOTTOM
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 4.65 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2650.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE
STATION 3C

PLATE 34



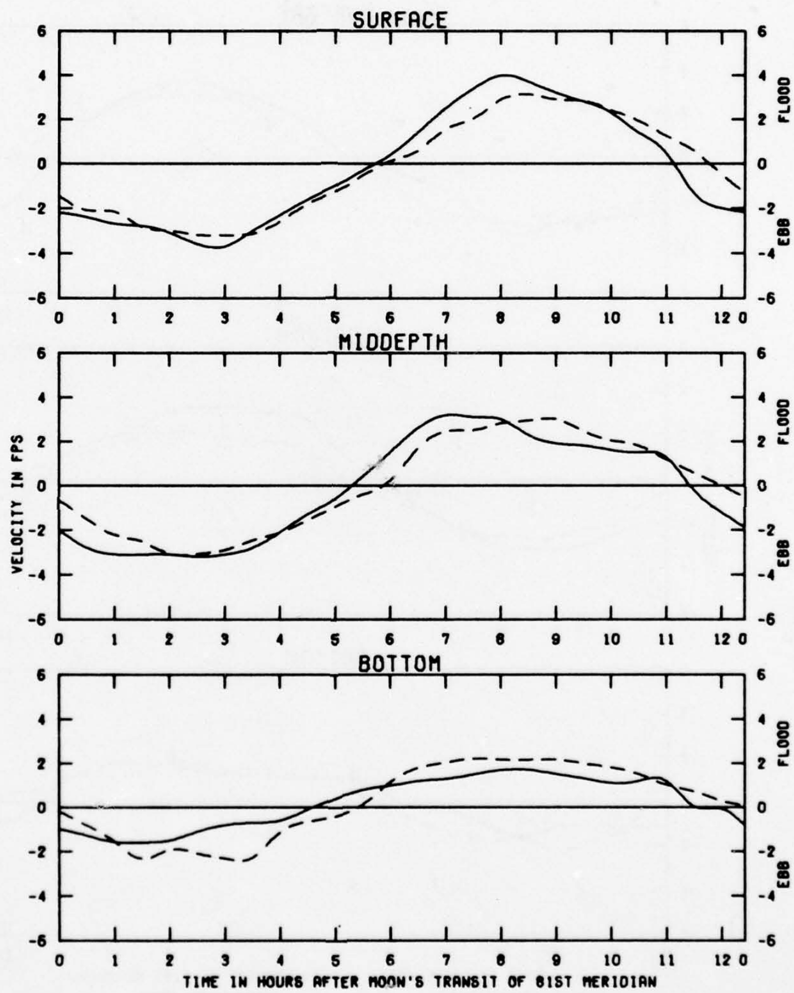
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

STATION
5A



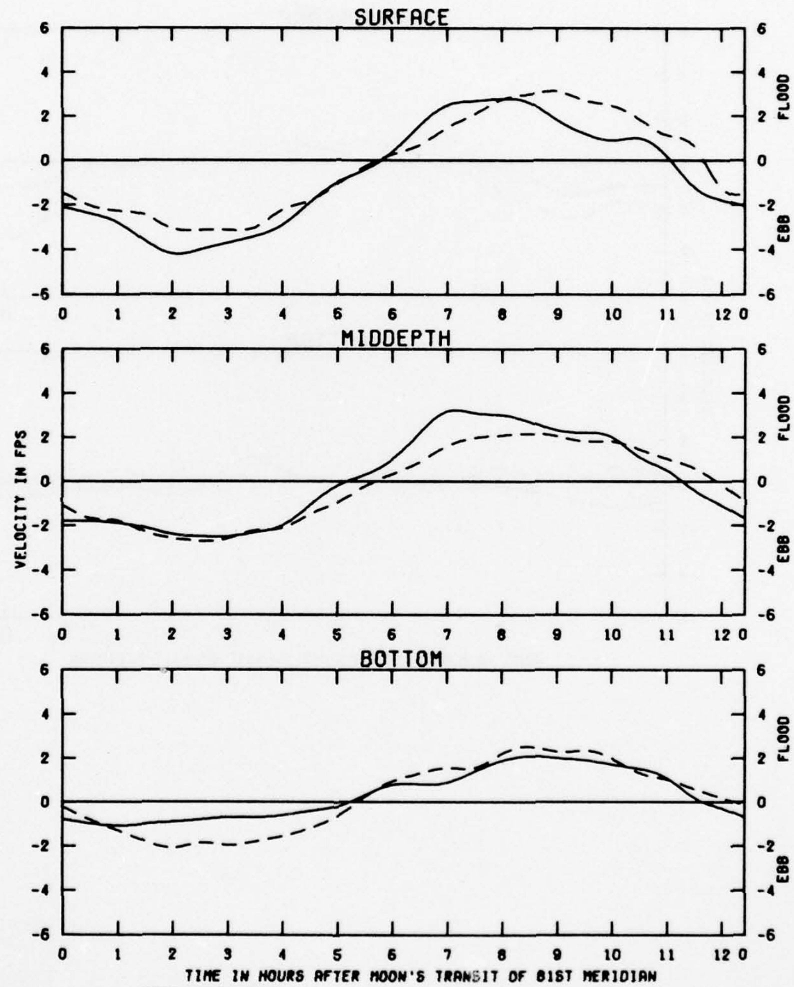
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 58

PLATE 36



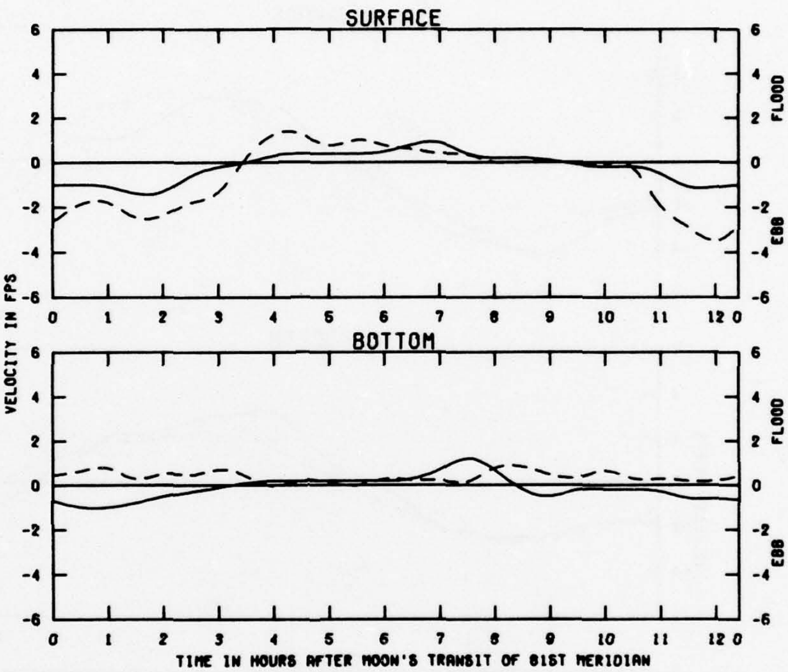
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ————
MODEL – – – –

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 5C



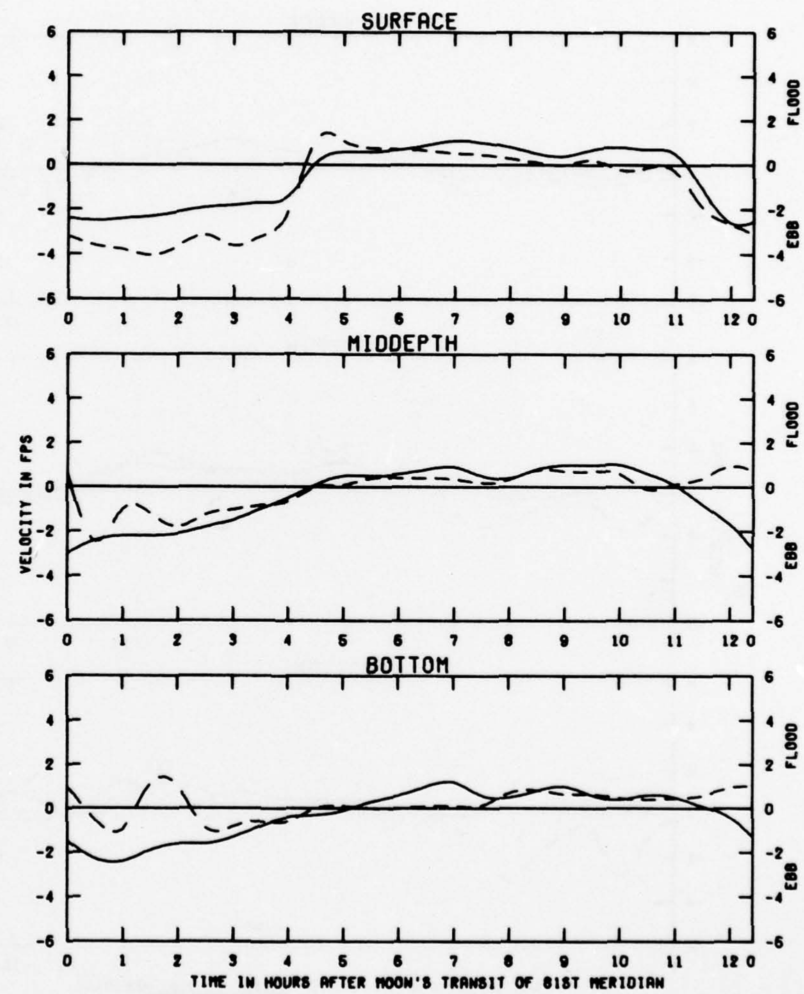
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL - - -

VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

STATION
6A



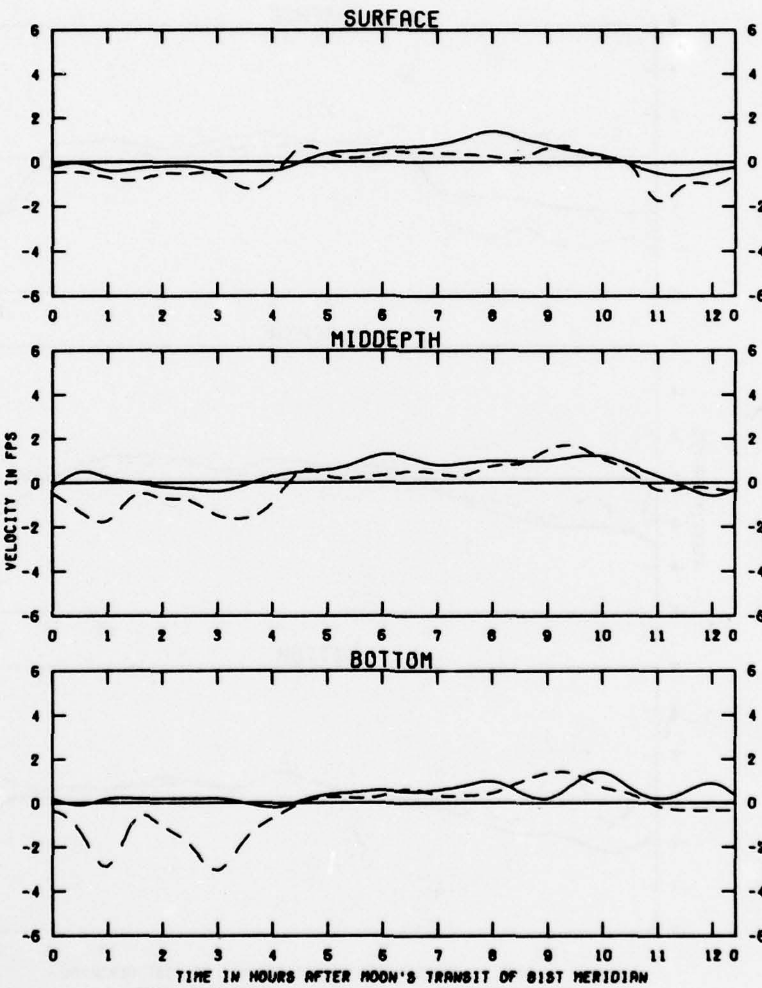
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ————
MODEL — — —

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 68



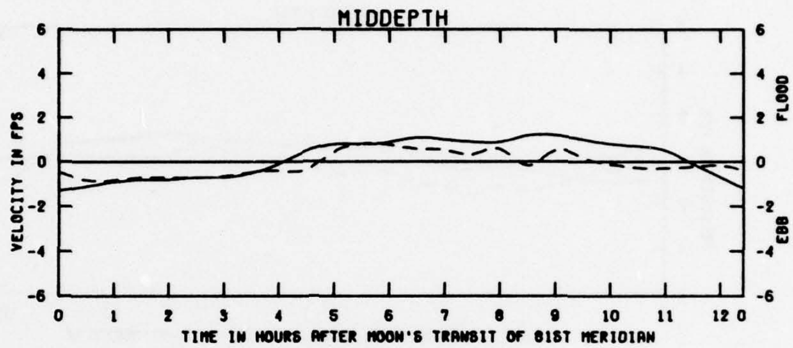
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

STATION
6C

LEGEND
PROTOTYPE ————
MODEL — — —



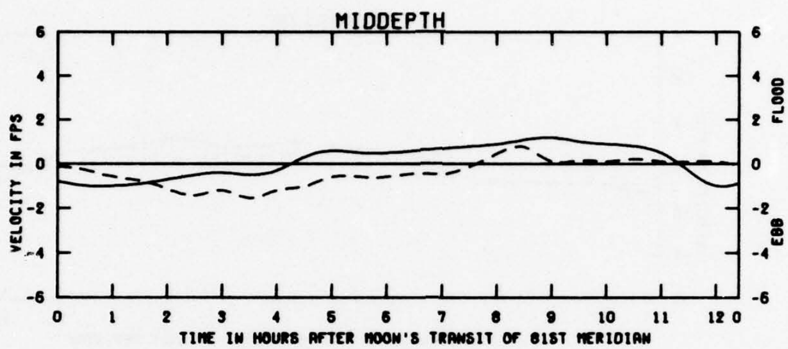
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 7A

LEGEND
PROTOTYPE ———
MODEL – – –



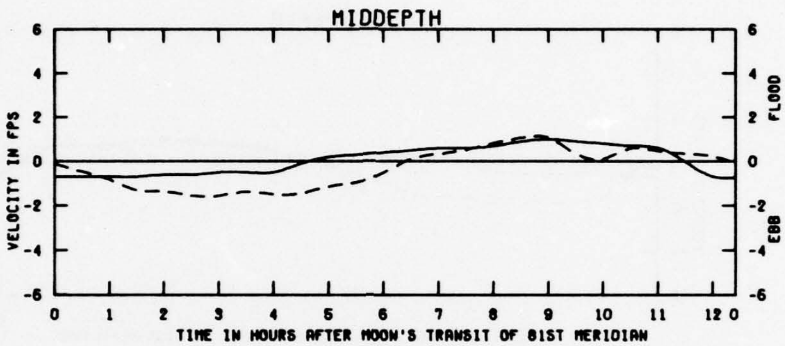
TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

STATION
78

PLATE 42



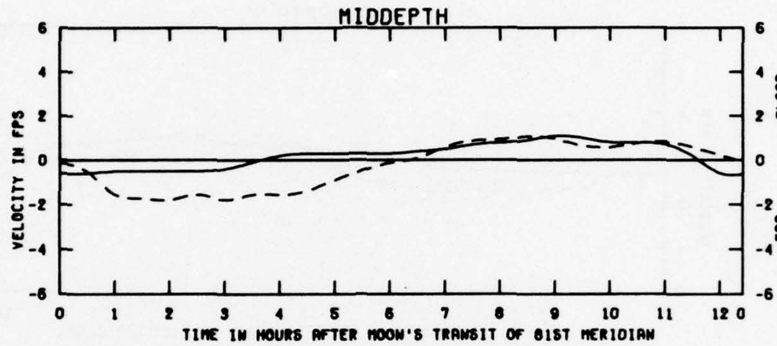
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 7C



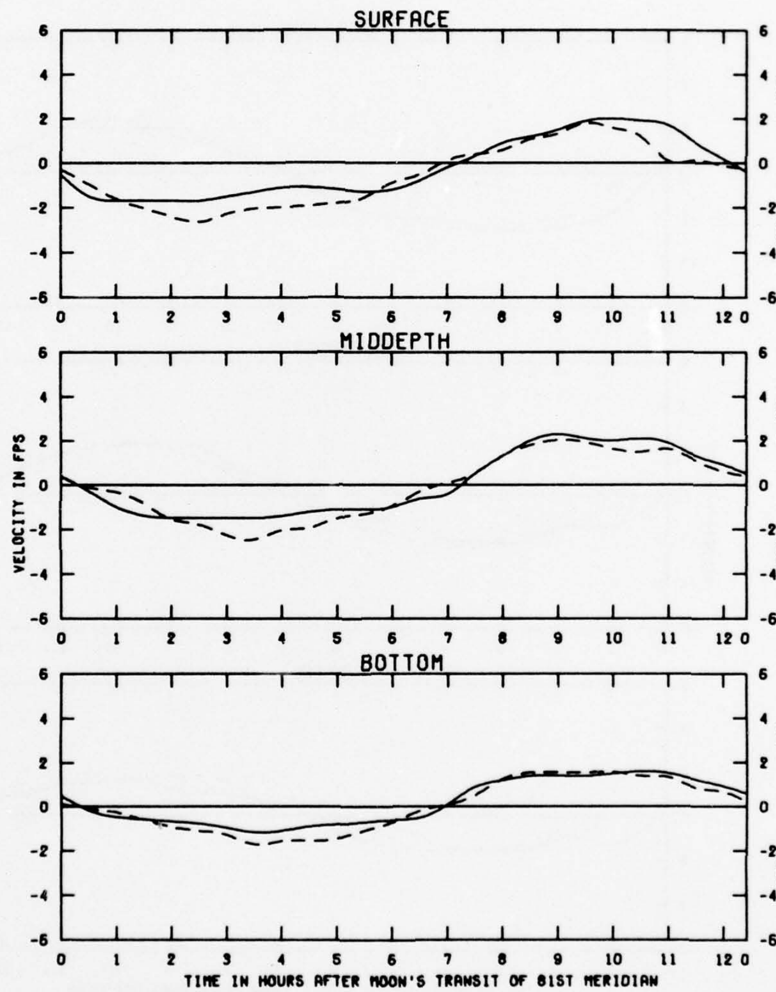
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 7D



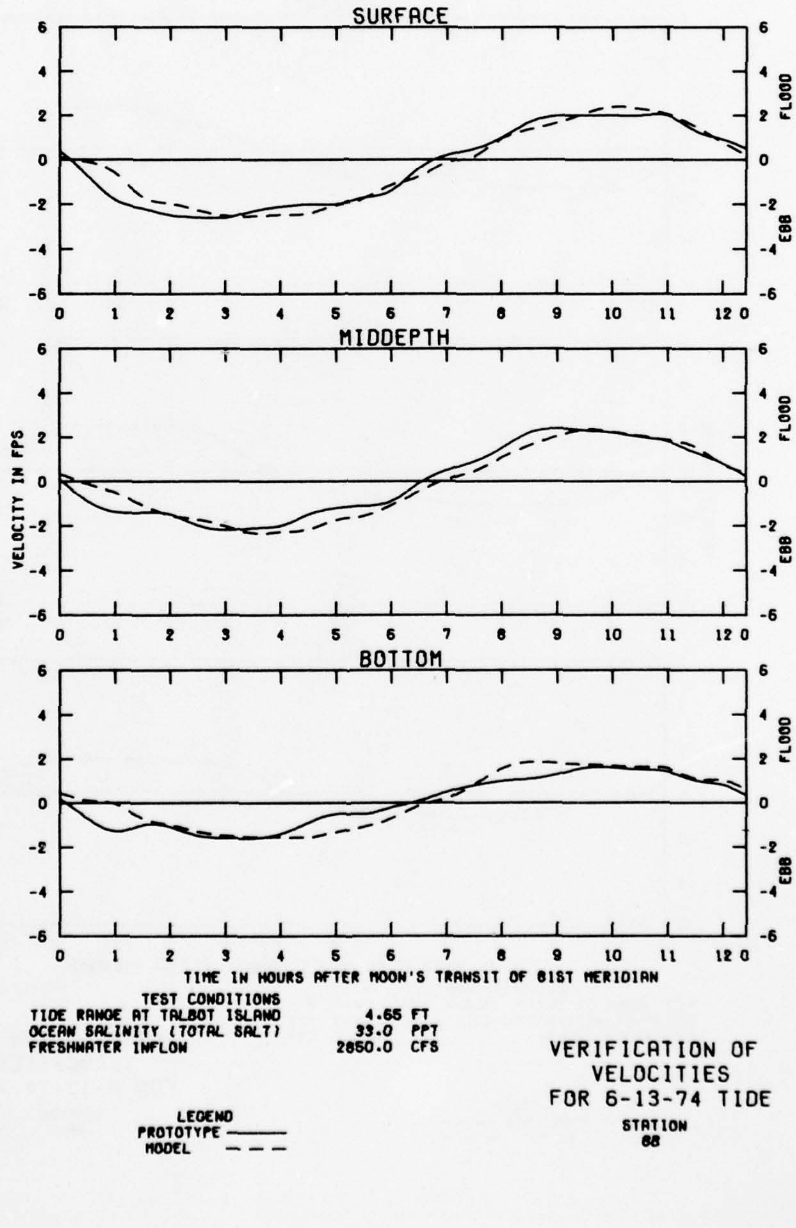
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

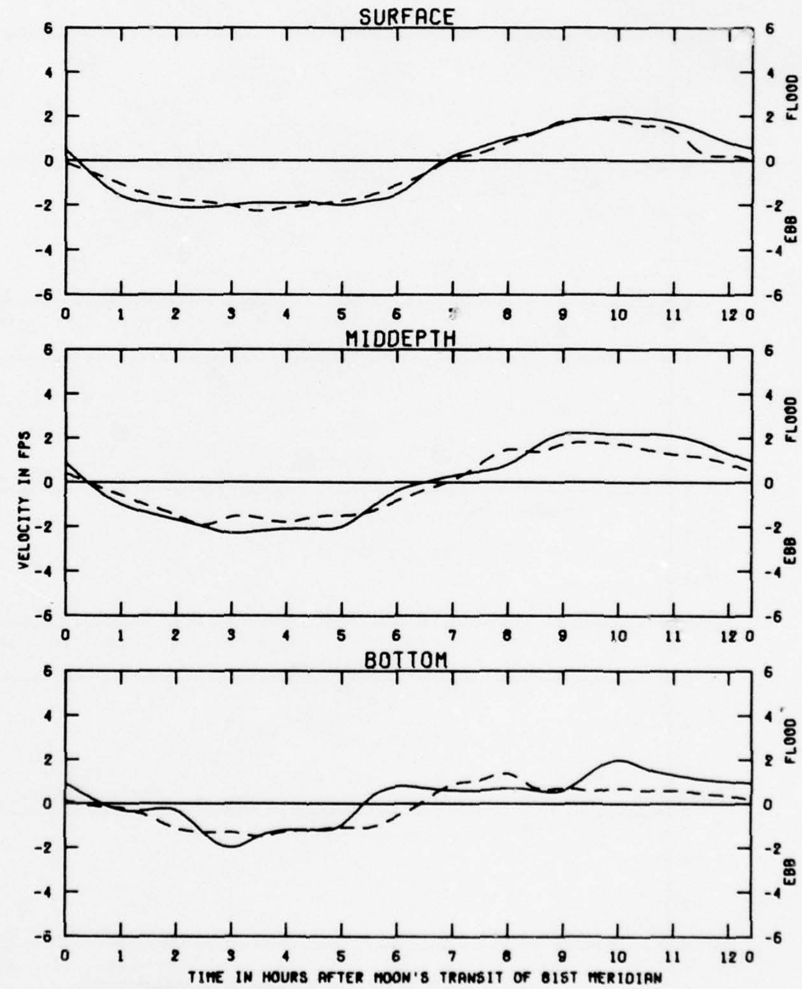
VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 8A



VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 88



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

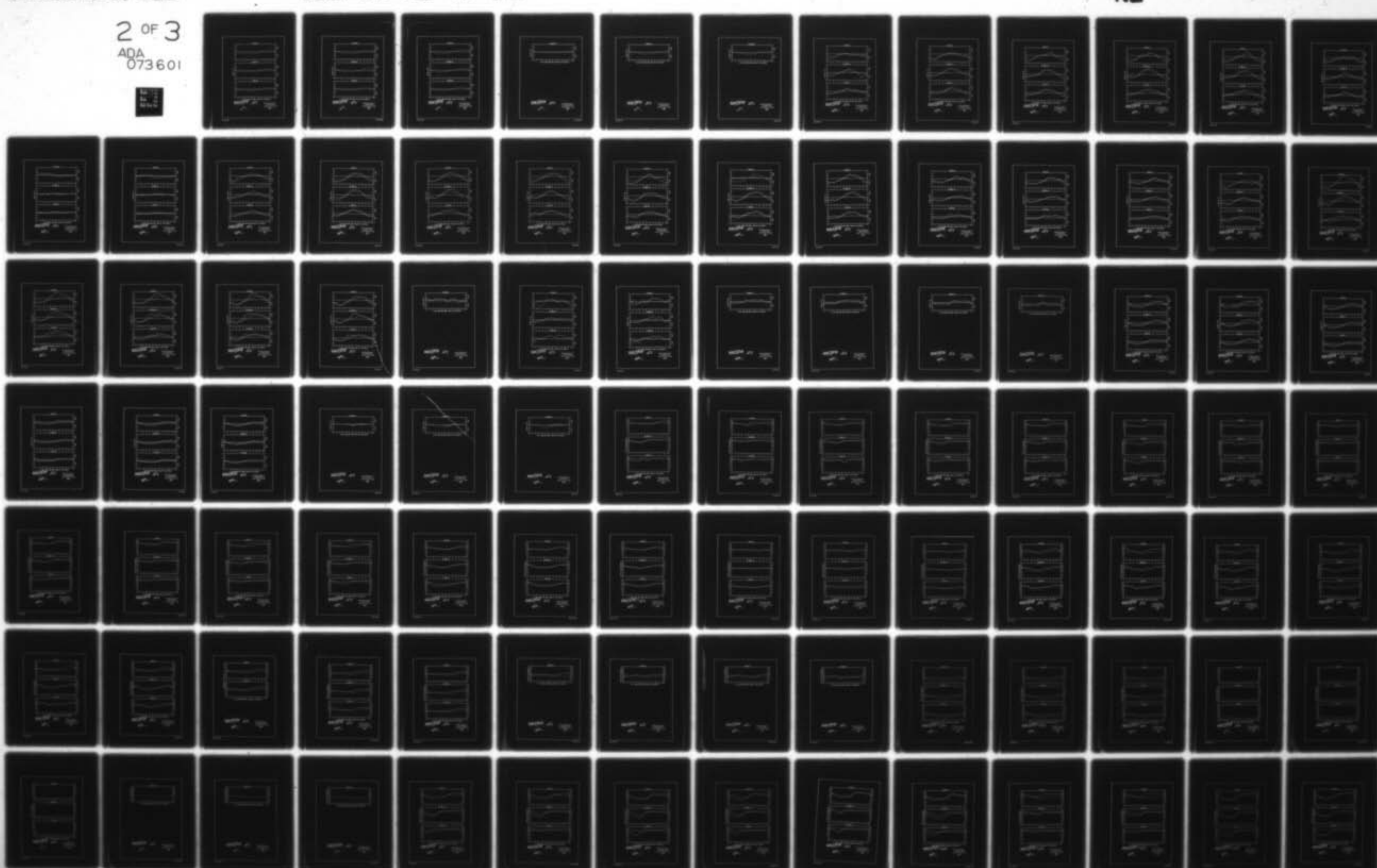
VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

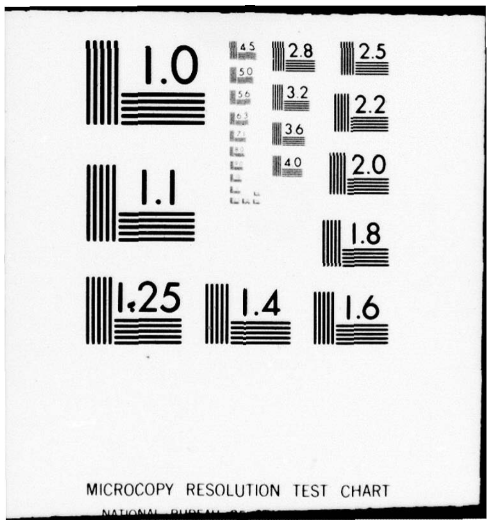
STATION 8C

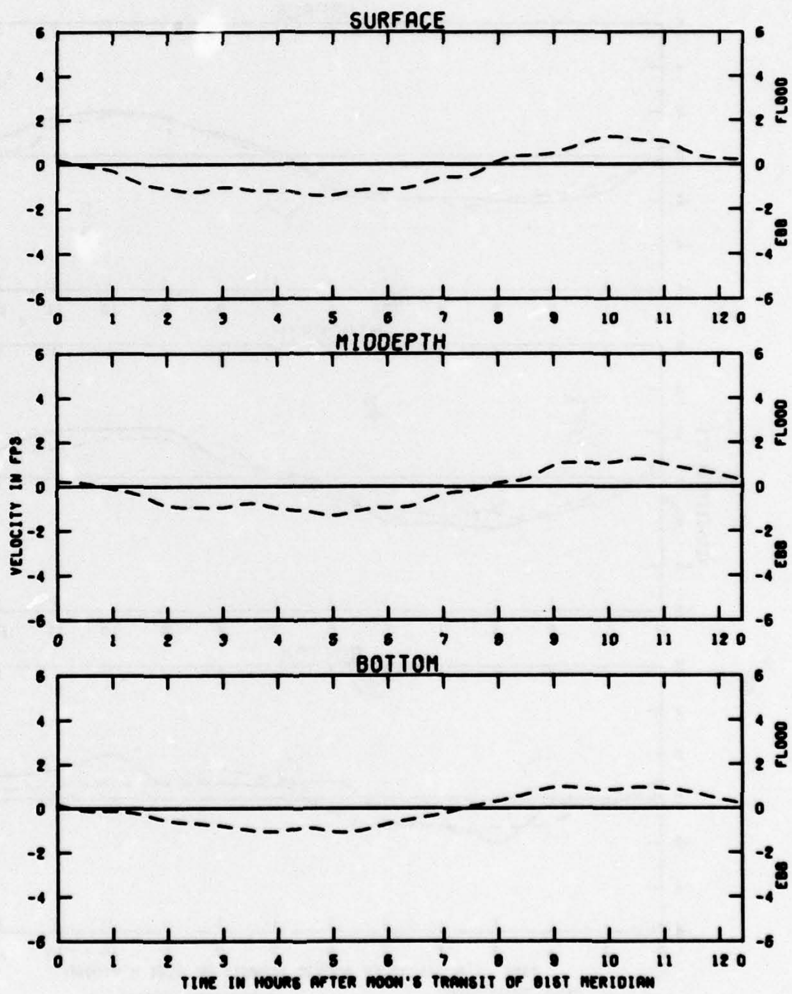
LEGEND
PROTOTYPE ————
MODEL – – –

AD-A073 601 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 8/8
MAYPORT-MILL COVE MODEL STUDY. REPORT 1. HYDRAULIC, SALINITY, A--ETC(U)
JUL 79 N J BROGDON
UNCLASSIFIED WES-TR-HL-79-12 NL

2 OF 3
ADA
073601




1.0
4.5
5.0
5.6
6.3
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6
MICROCOPY RESOLUTION TEST CHART



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

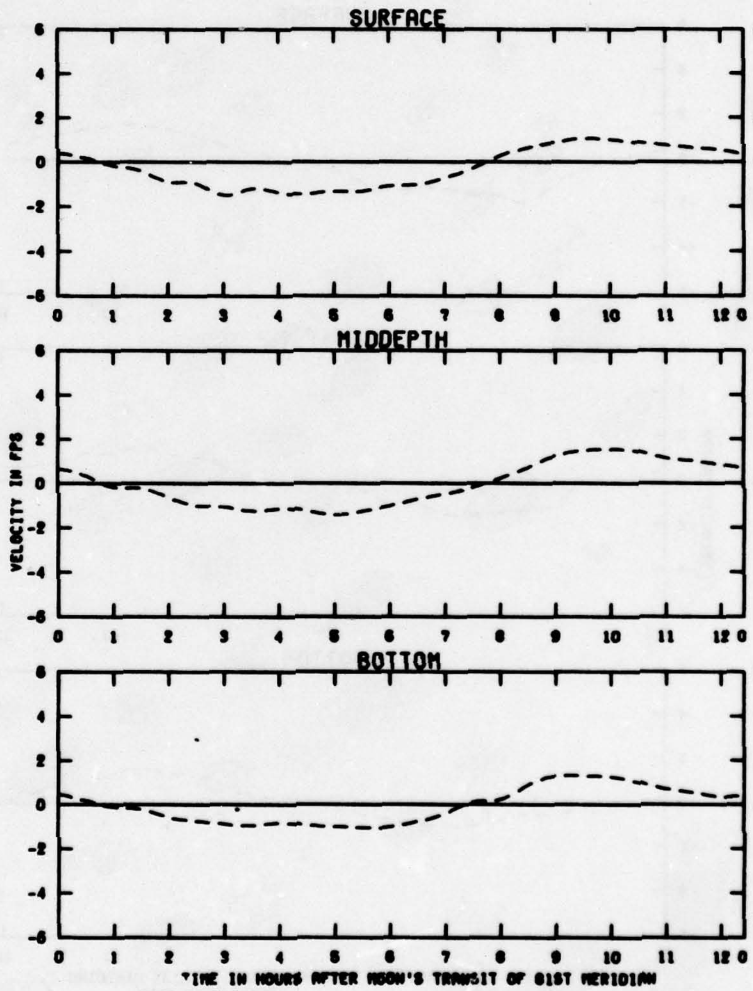
VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

LEGEND

MODEL – – –

STATION 9A

PLATE 48



TEST CONDITIONS

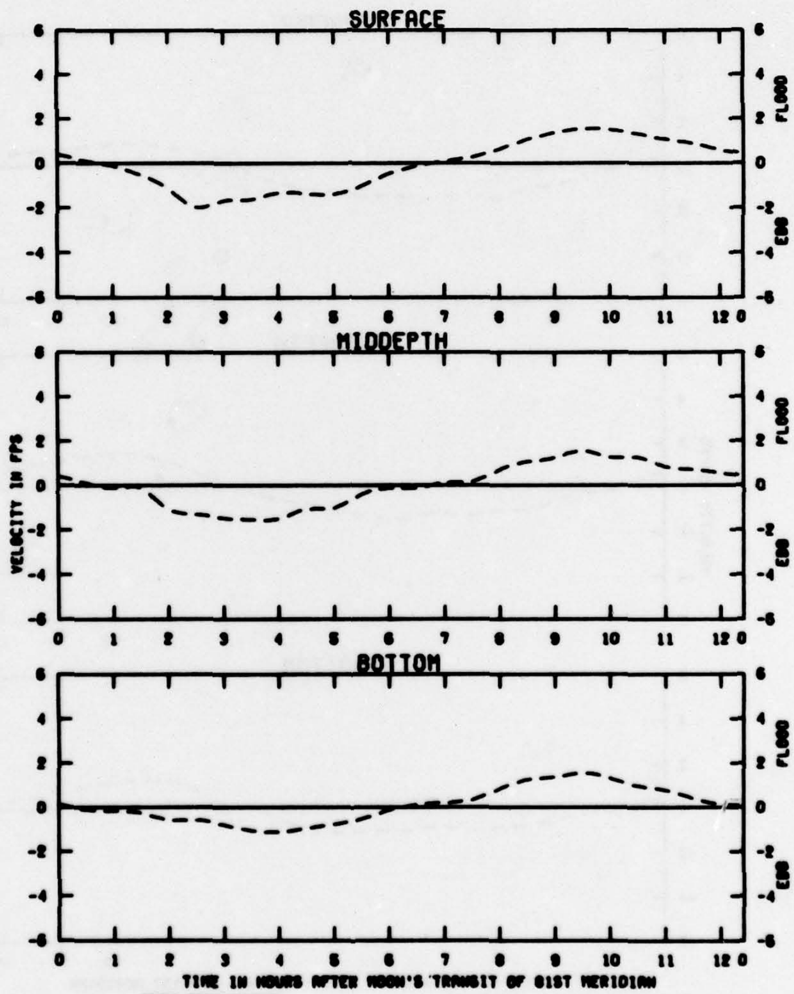
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND

MODEL – – –

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 98



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

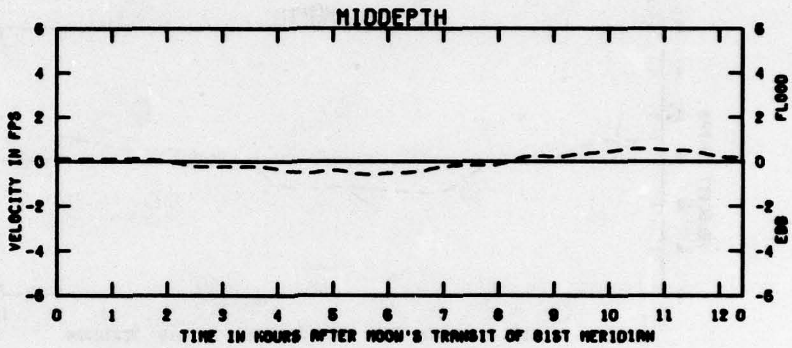
VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

LEGEND

MODEL - - -

STATION
SC

PLATE 50



TEST CONDITIONS

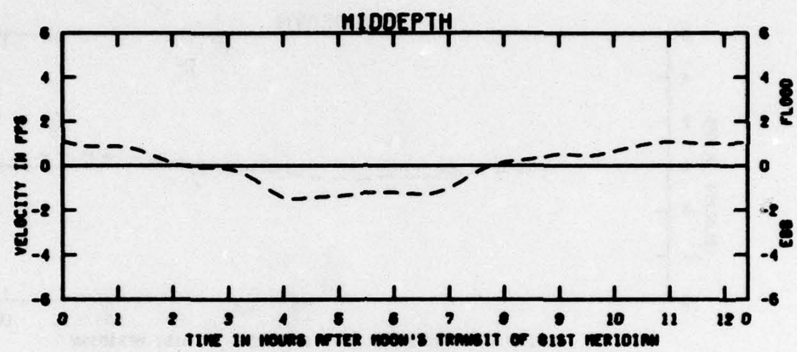
TIDE RANGE AT TALBOT ISLAND	4.06	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2000.0	CFS

LEGEND

MODEL - - -

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 10A



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.86	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2880.0	CFS

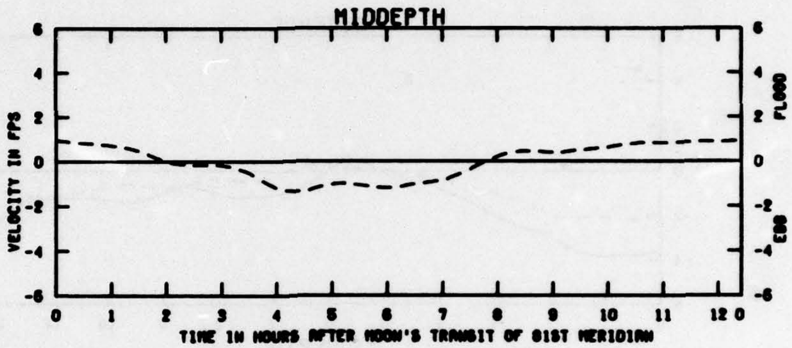
LEGEND

MODEL - - -

VERIFICATION OF VELOCITIES FOR 6-13-74 TIDE

STATION 10B

PLATE 52



TEST CONDITIONS

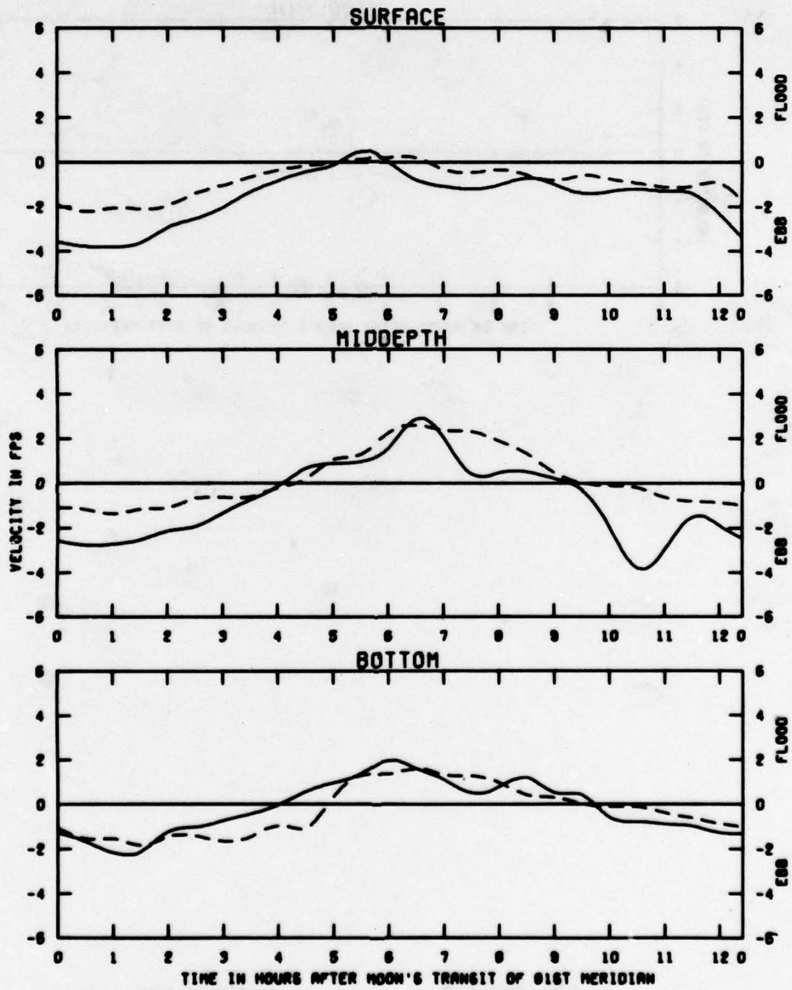
TIDE RANGE AT TALBOT ISLAND	4.66	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2080.0	CFS

LEGEND

MODEL - - -

VERIFICATION OF
VELOCITIES
FOR 6-13-74 TIDE

STATION
10C



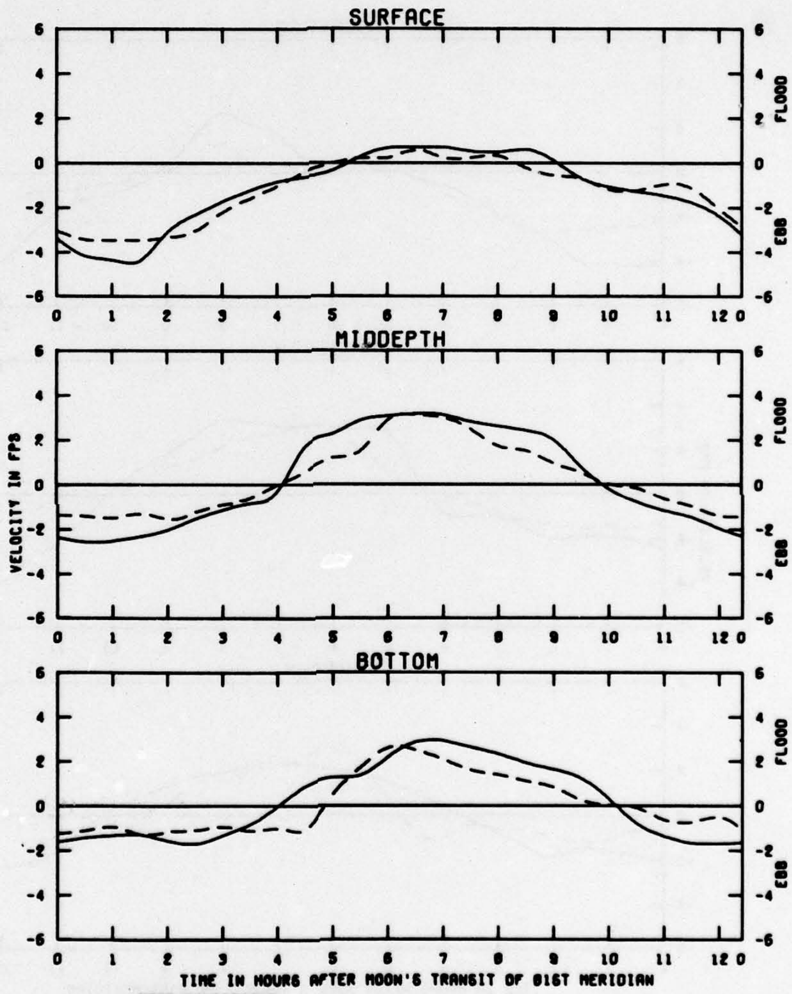
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 1A



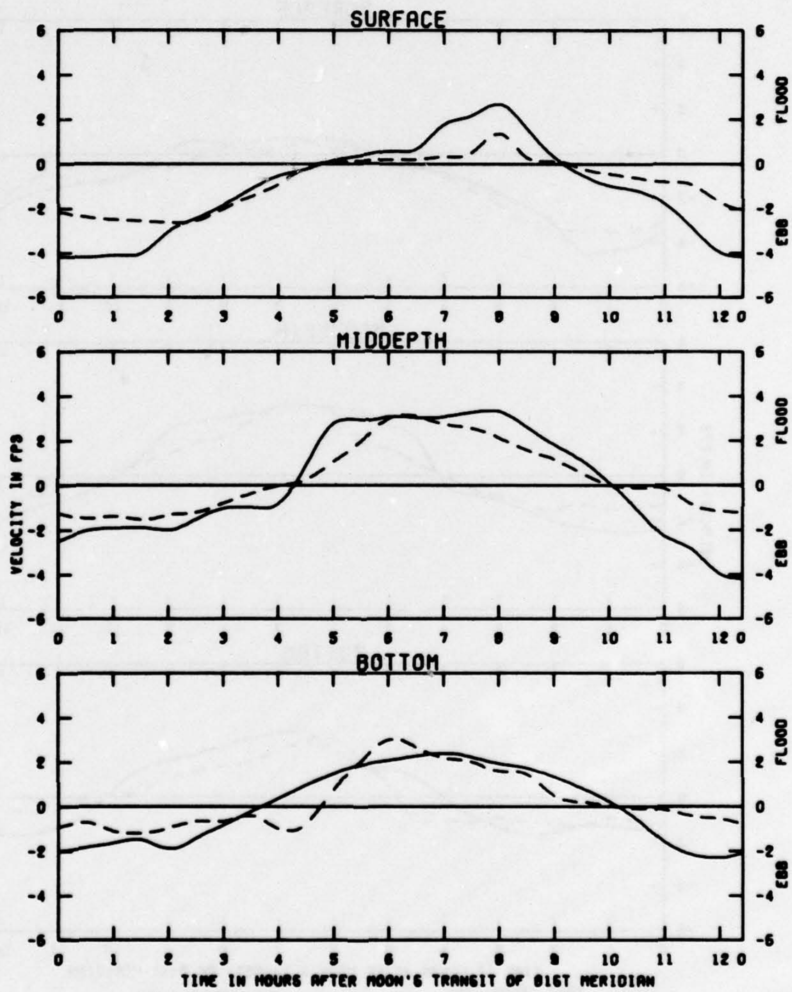
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 18



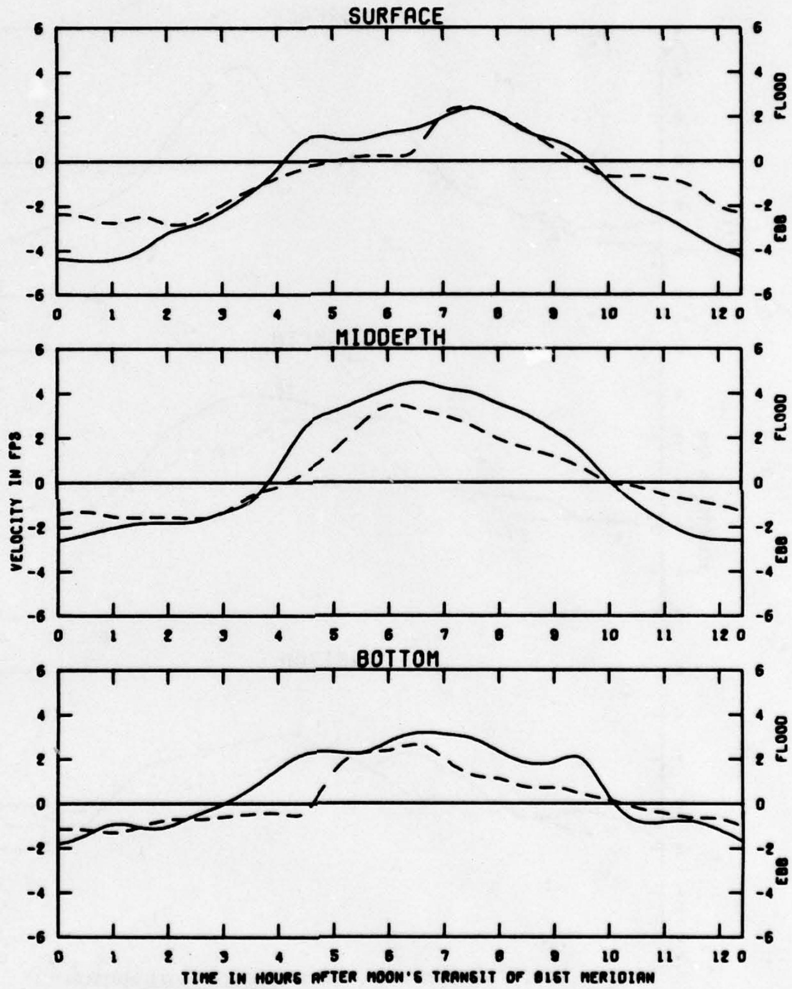
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
1C



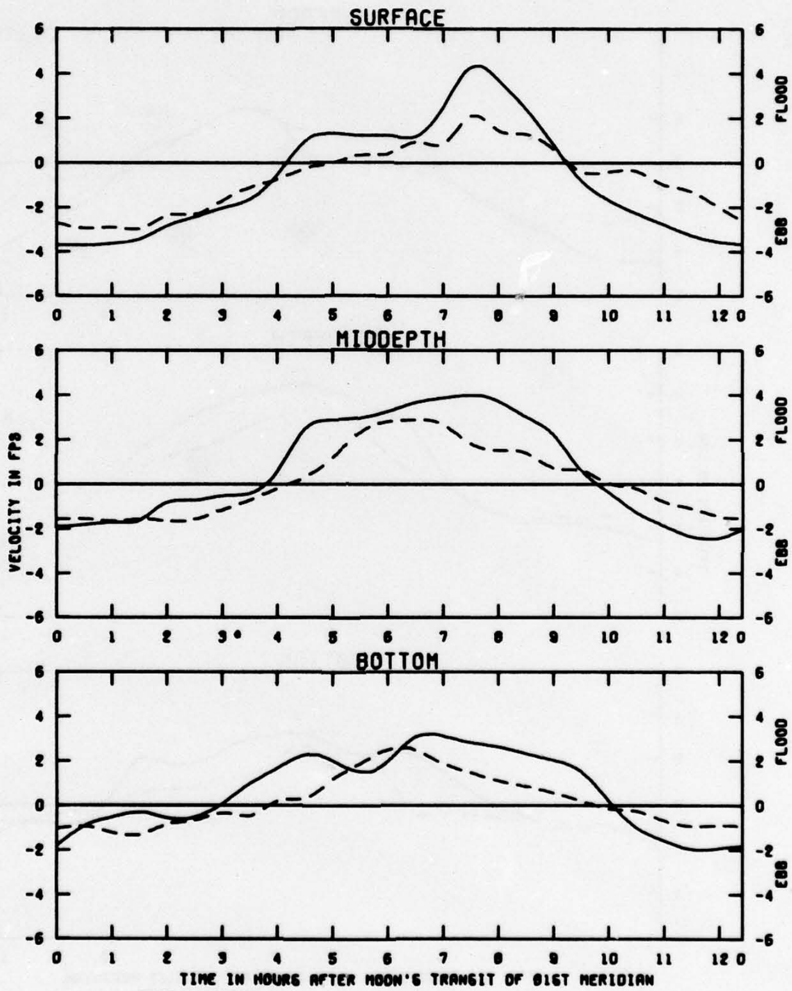
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
10

LEGEND
PROTOTYPE ———
MODEL – – –

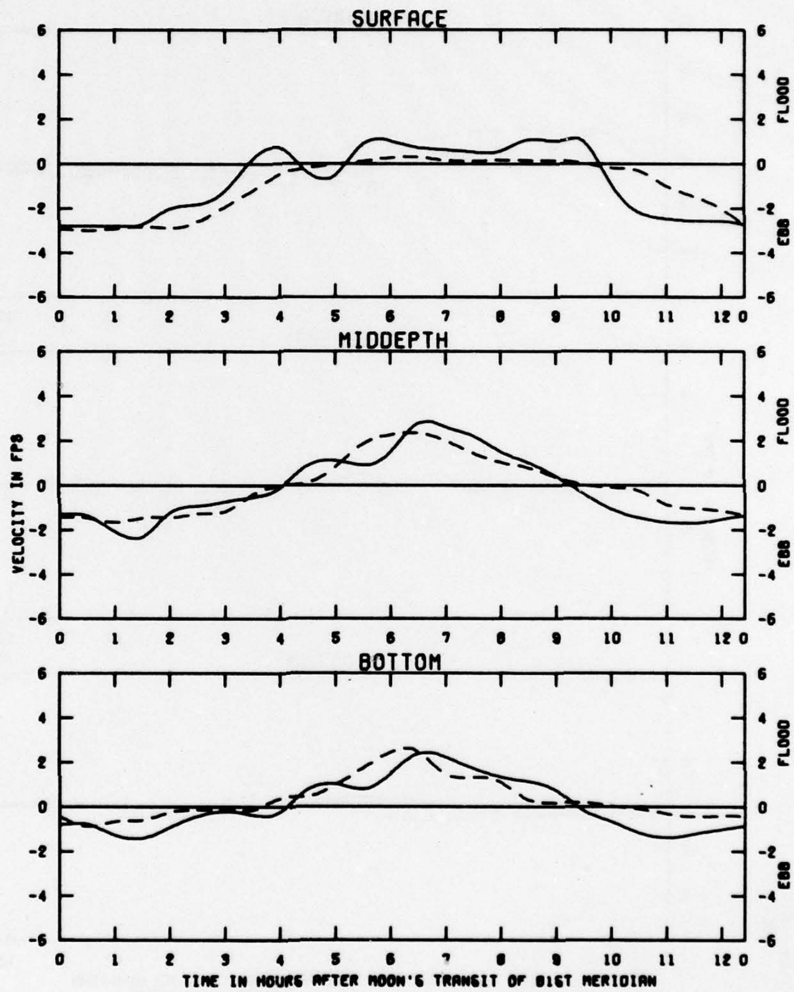


TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 1E



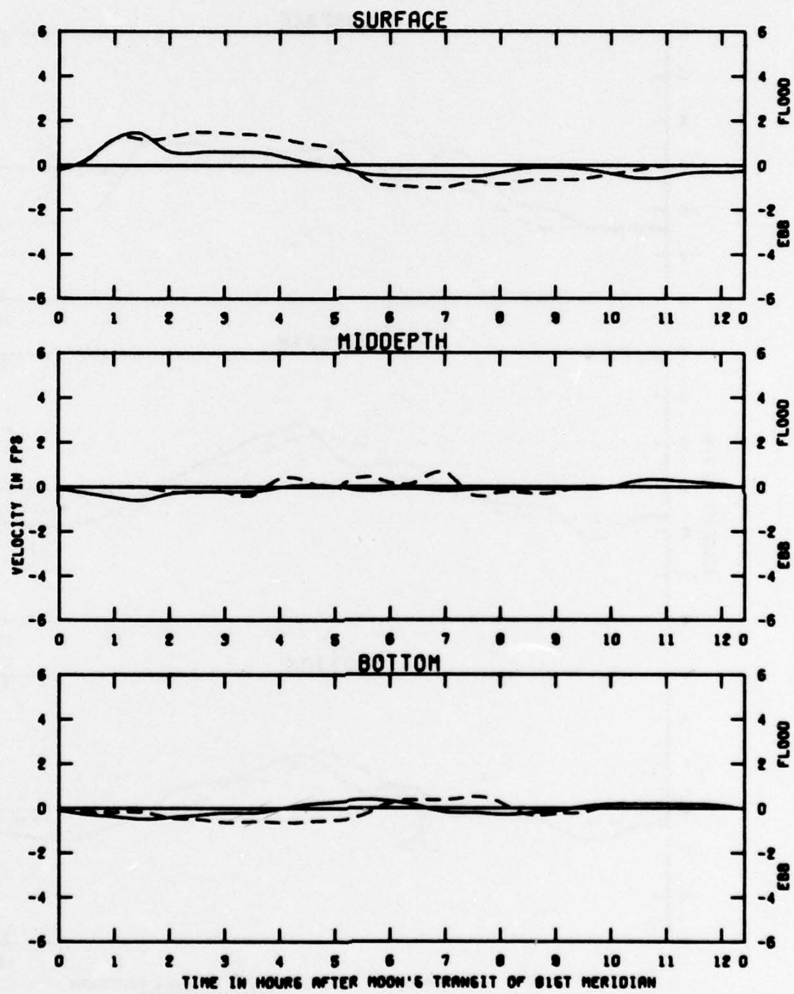
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
1F



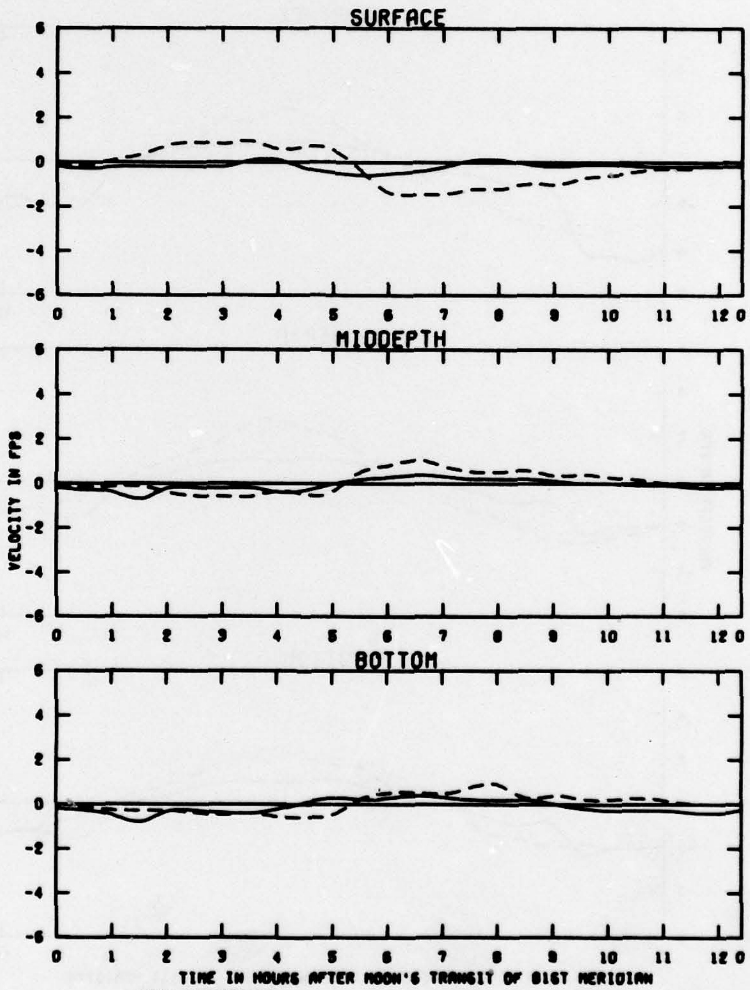
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

LEGEND
PROTOTYPE ———
MODEL - - -

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 2A



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
28

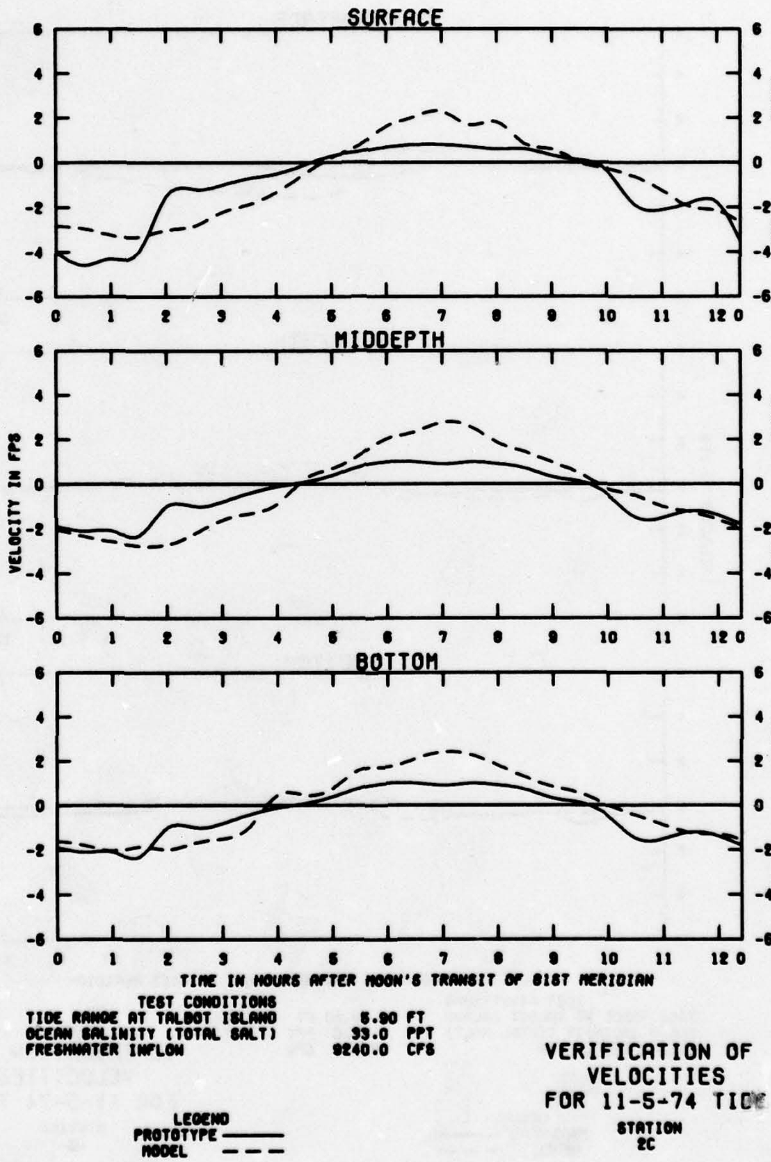
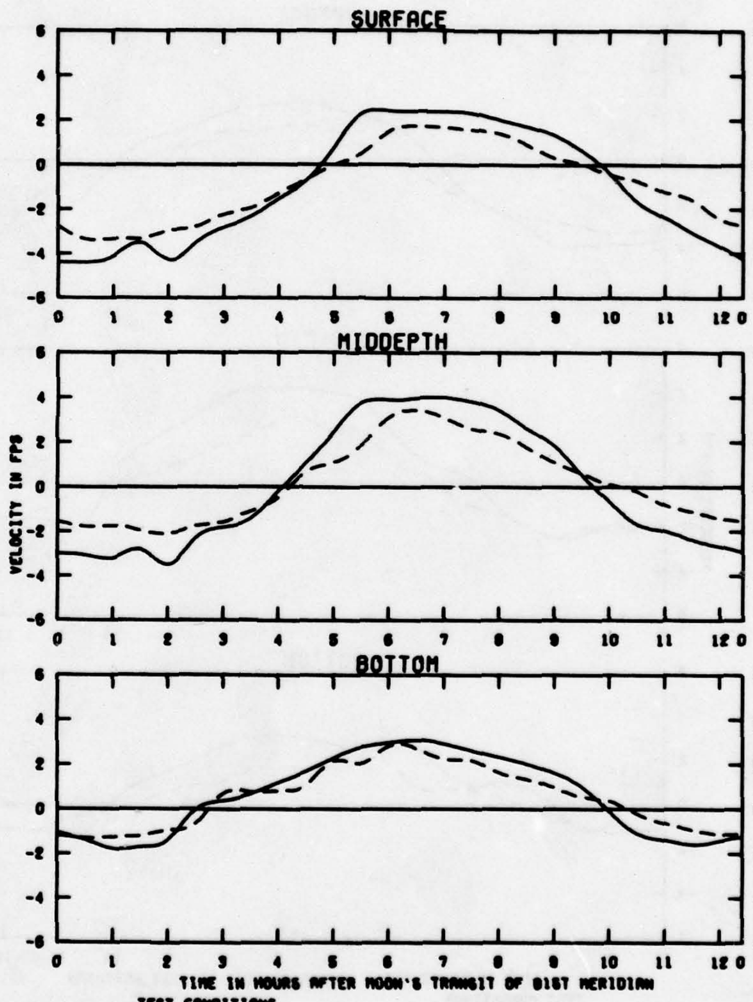

SURFACE
MIDDEPTH
BOTTOM
VELOCITY IN FPS
FLOOD
EBB
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8240.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE
STATION
2C

PLATE 62



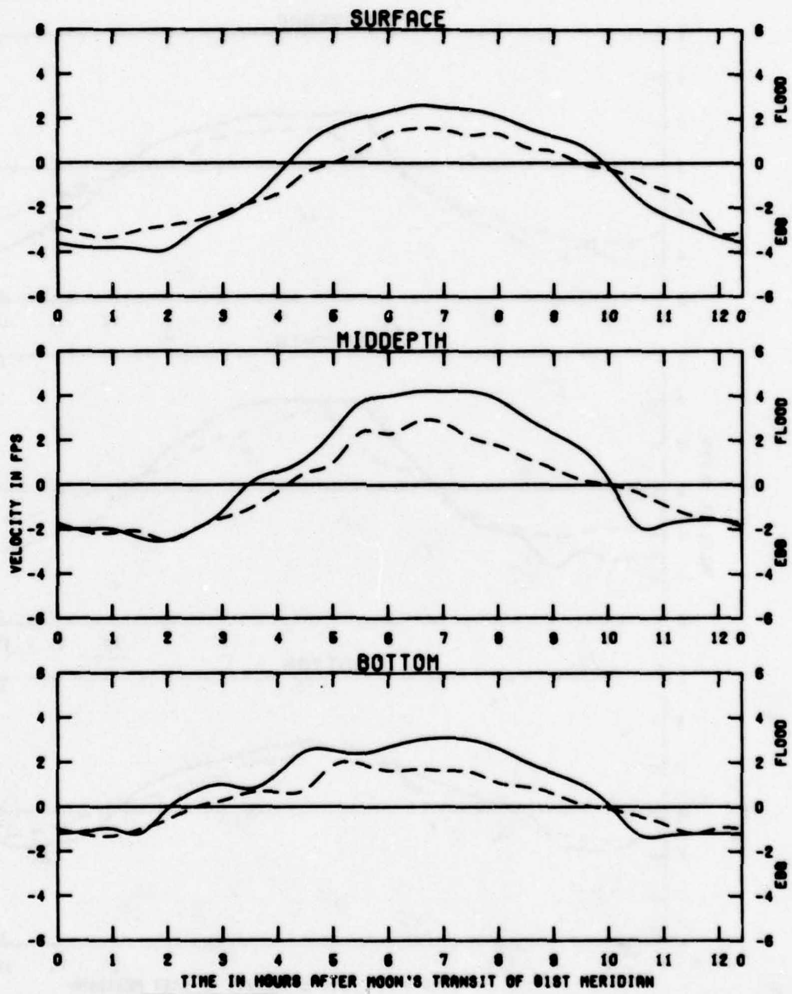
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
20



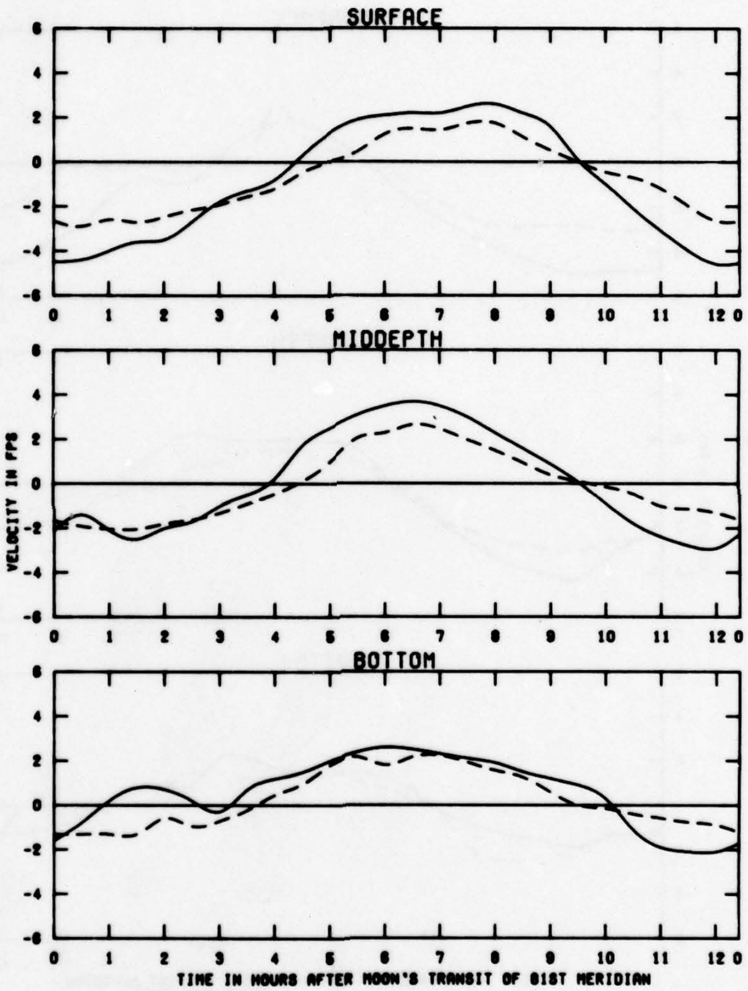
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION
2E



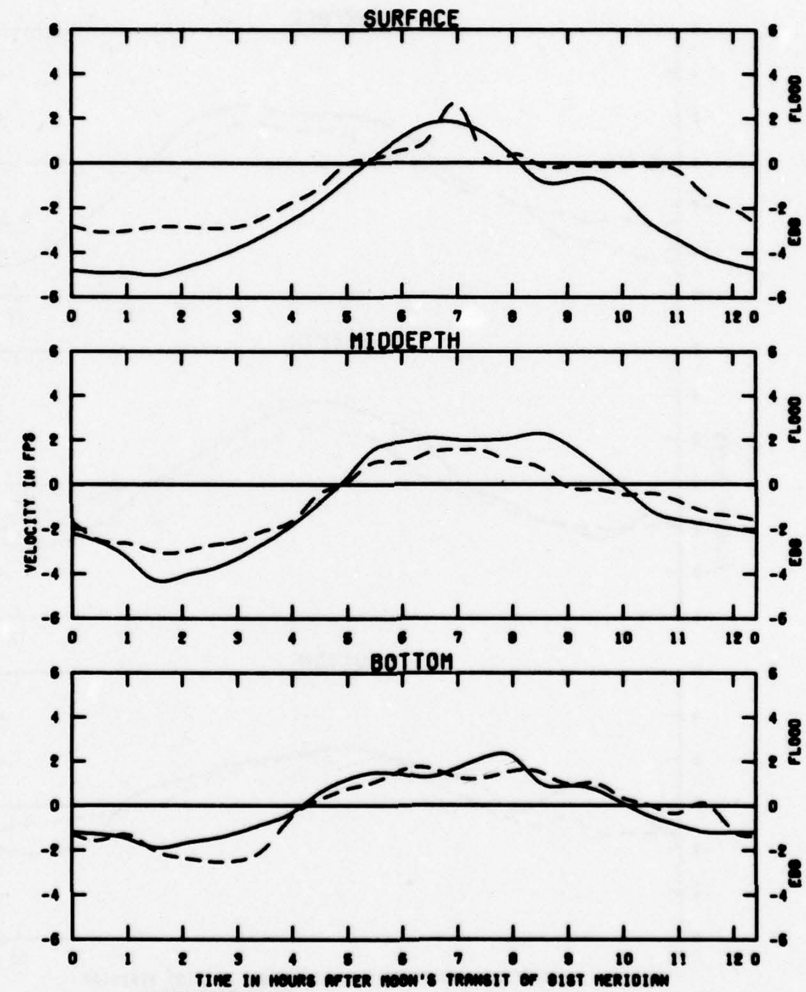
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

LEGEND
PROTOTYPE ———
MODEL - - -

STATION 2F



TEST CONDITIONS

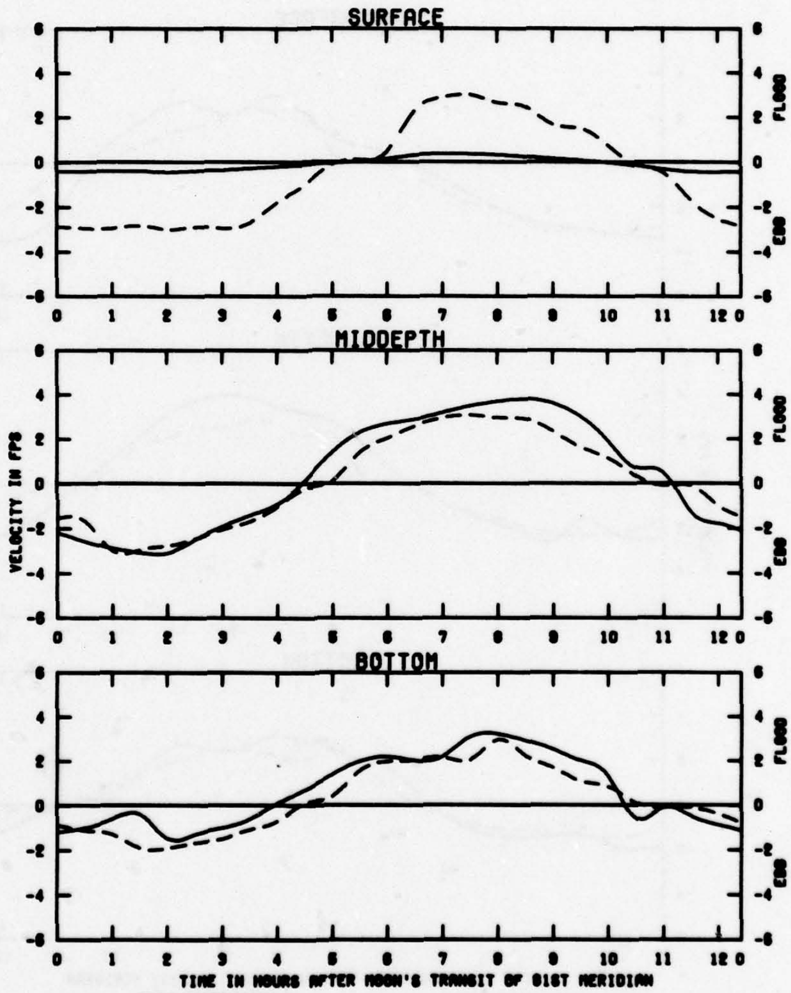
TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
3A

PLATE 66



TEST CONDITIONS

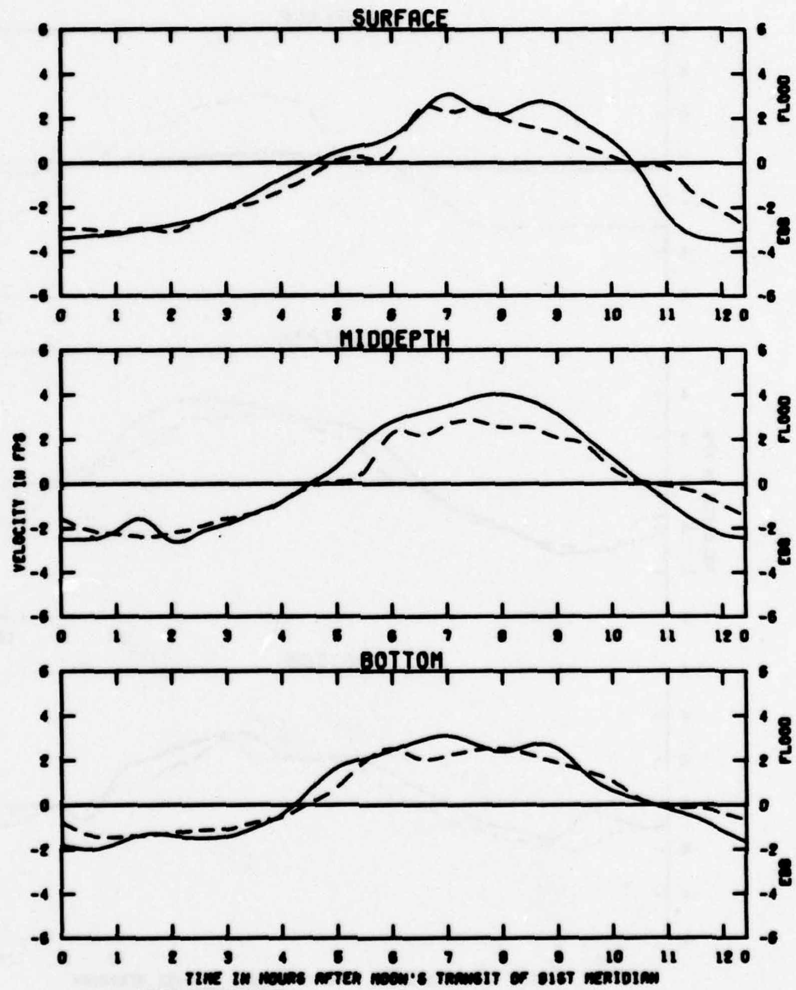
TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

STATION
38

PLATE 67



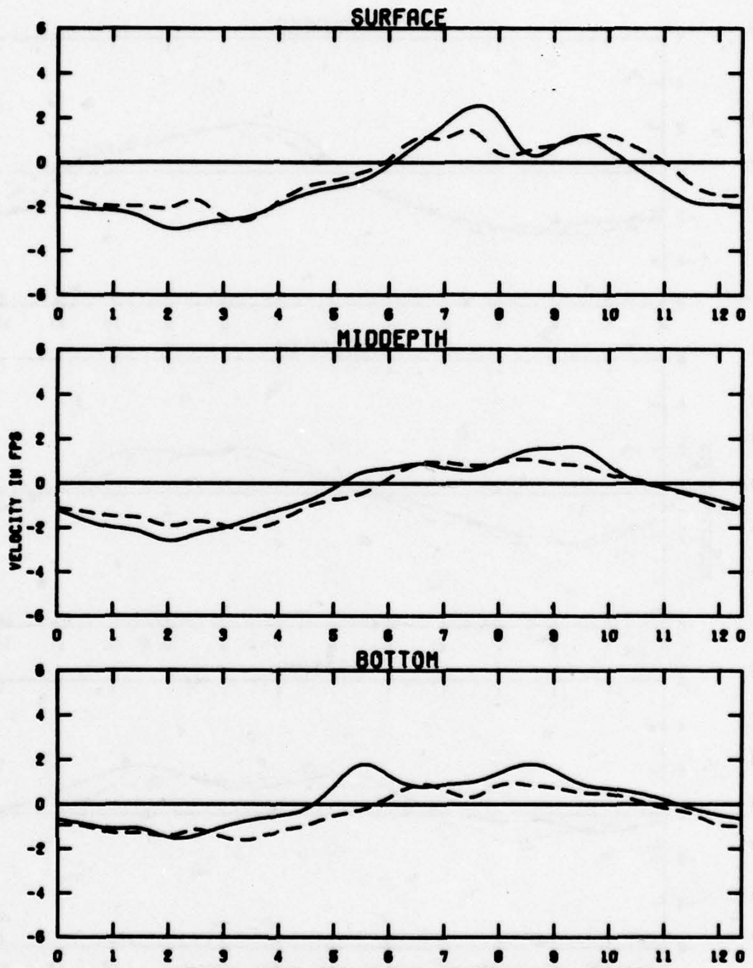
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

VERIFICATION OF
VELOCITIES
FOR 11-5-74 TIDE

LEGEND
PROTOTYPE ———
MODEL – – –

STATION
3C



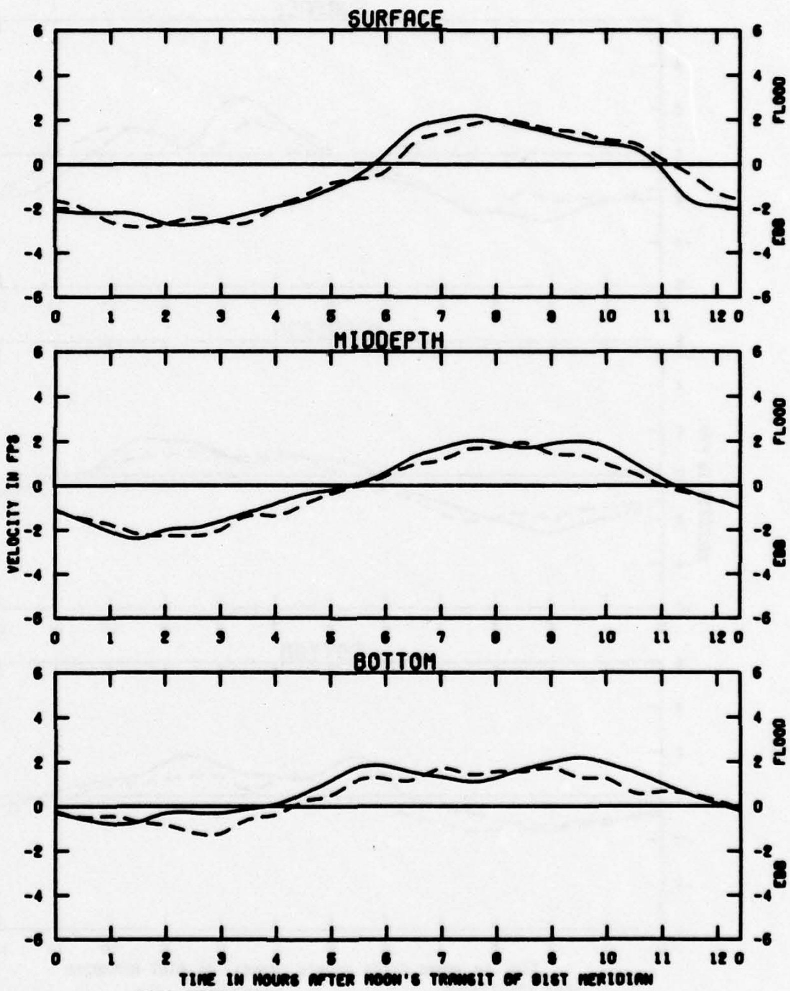
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 4A



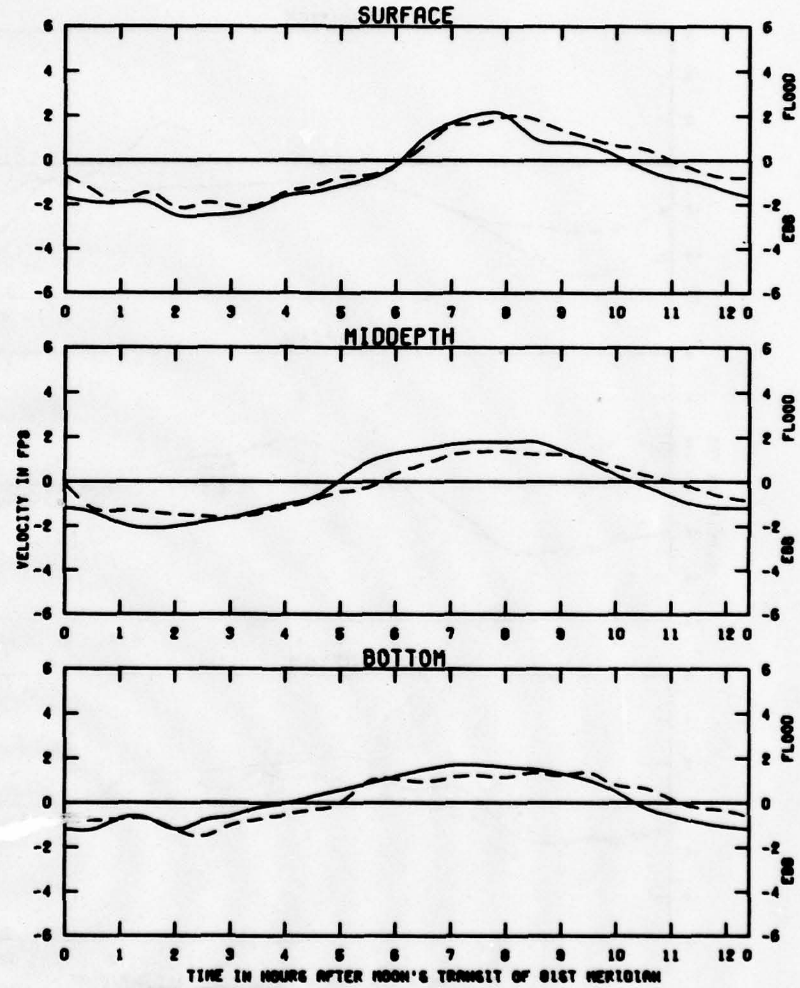
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND 5.80 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8240.0 CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 4B



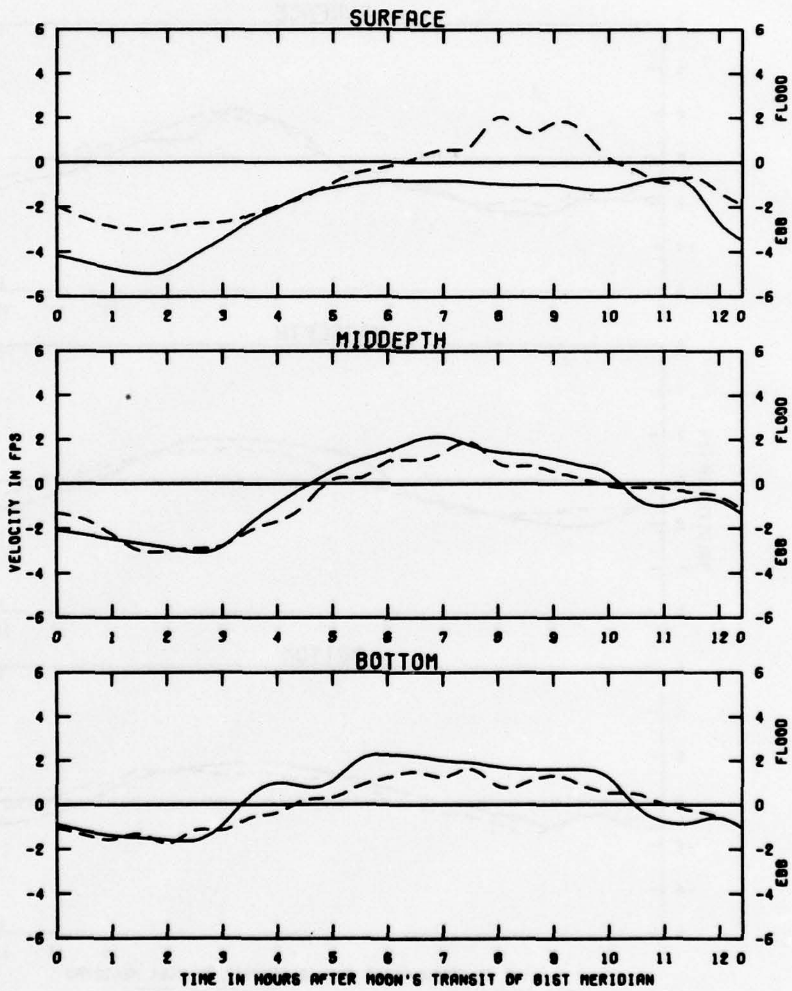
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-5-74 TIDE

STATION 4C



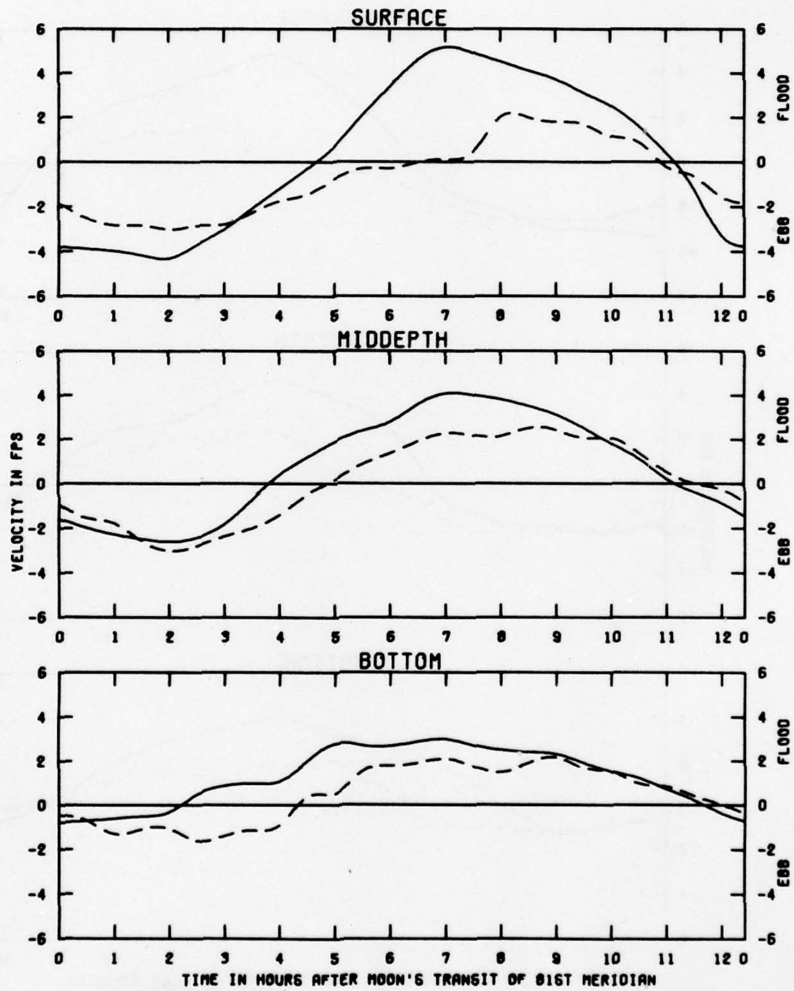
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION 3A



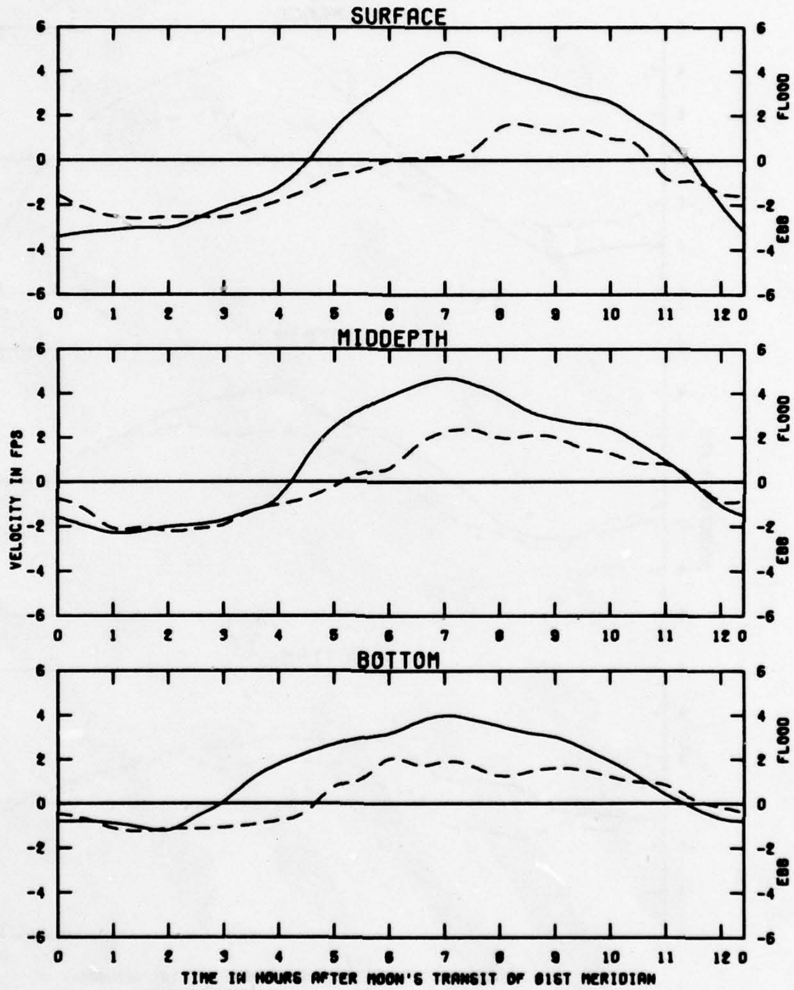
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
38



TEST CONDITIONS

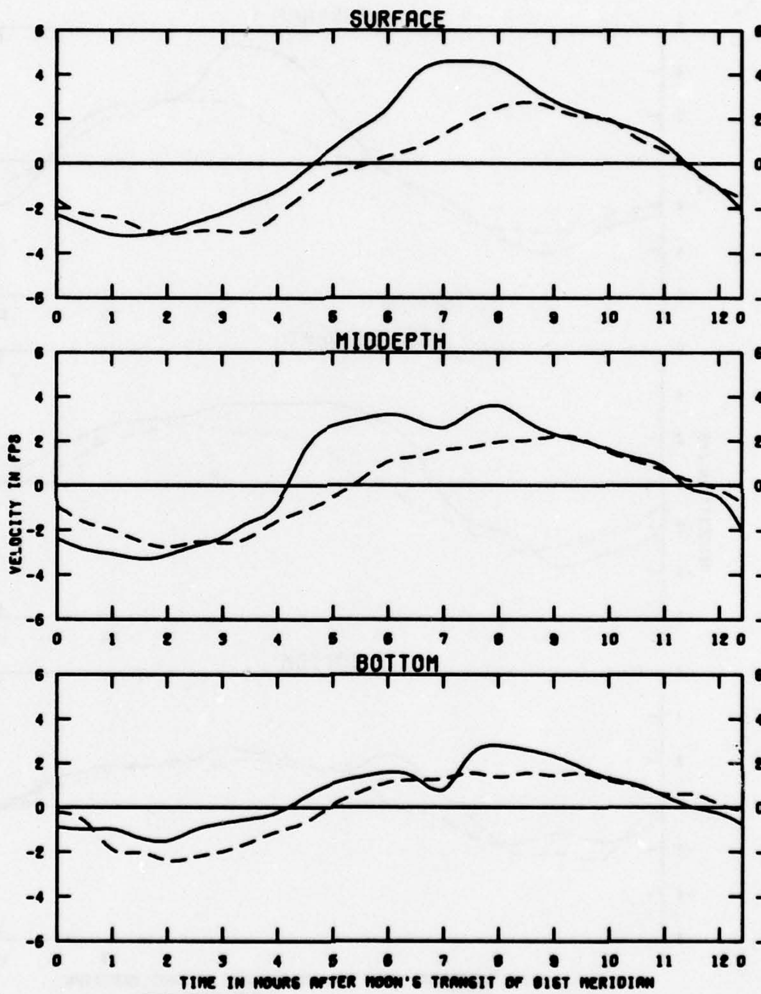
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
3C

PLATE 74



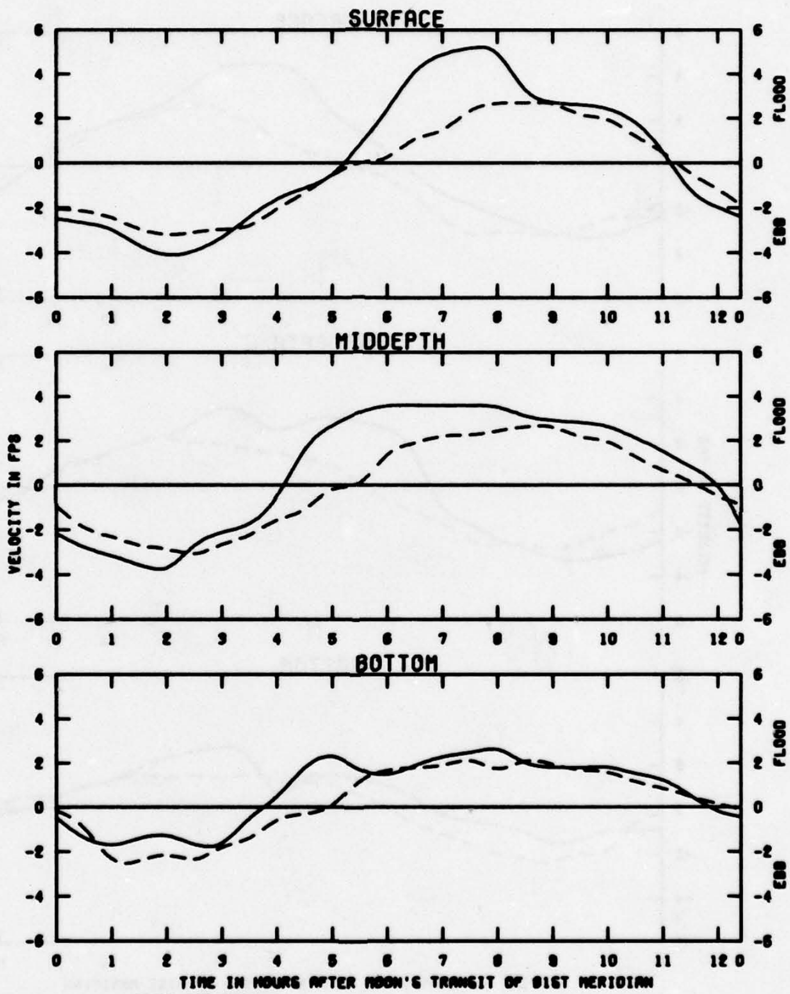
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

LEGEND
PROTOTYPE ———
MODEL – – –

STATION
5A



TEST CONDITIONS

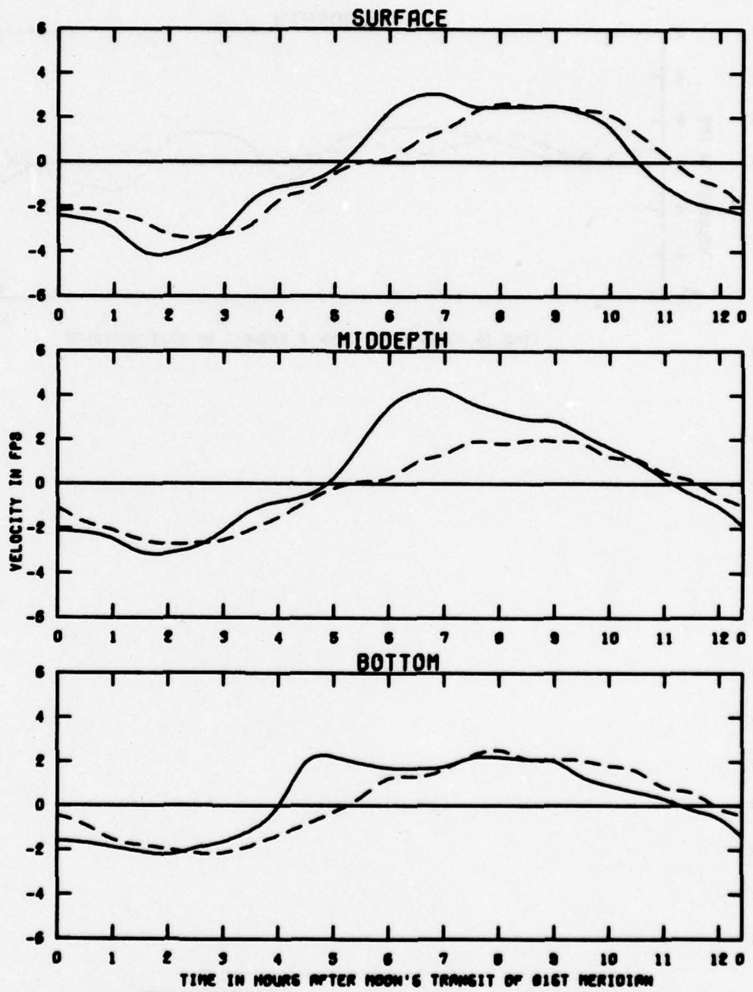
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION
58

PLATE 76



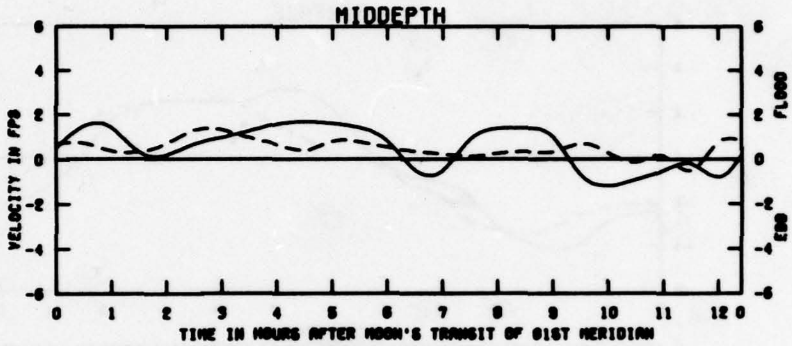
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION
SC

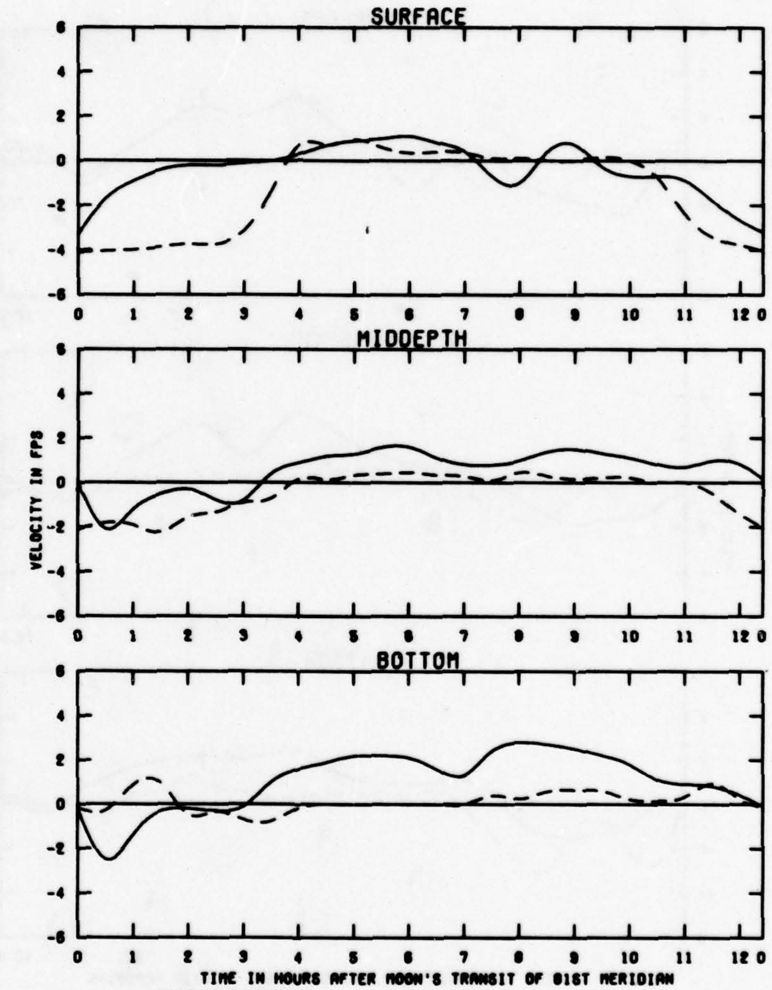


TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	35.0	PPT
FRESHWATER INFLOW	8040.0	CFS

LEGEND
PROTOTYPE ————
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
9A



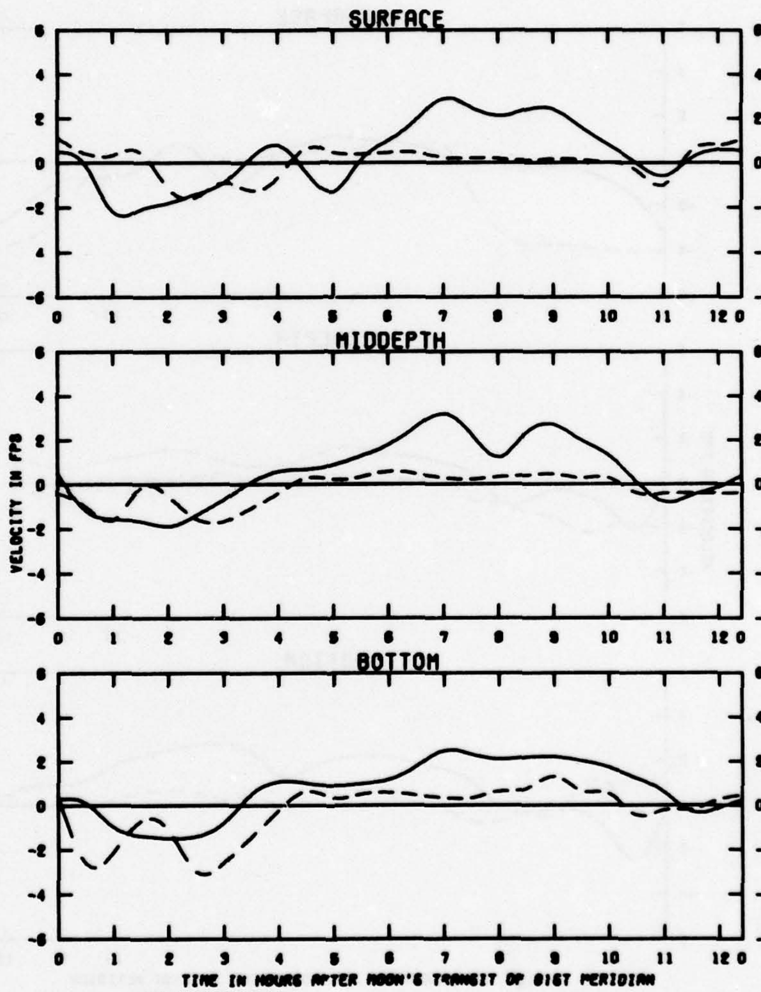
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION
6B



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

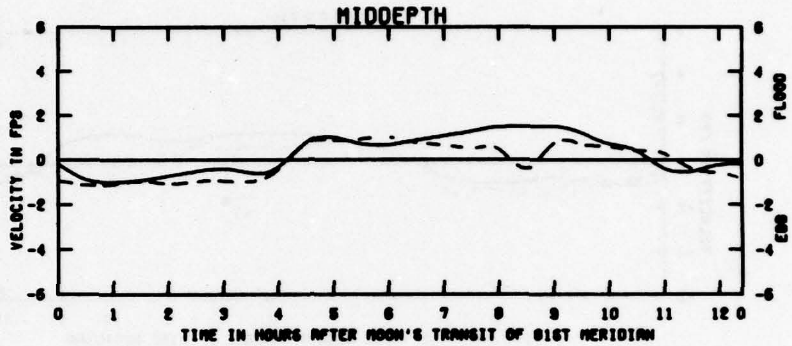
LEGEND

PROTOTYPE ———

MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION BC



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	6840.0	CFS

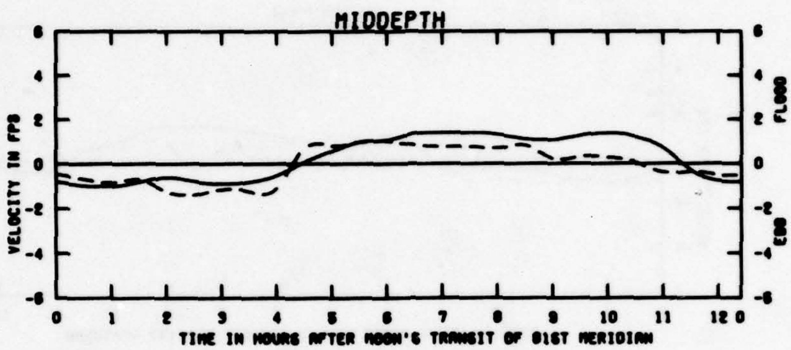
LEGEND

PROTOTYPE ———

MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
7A



TEST CONDITIONS

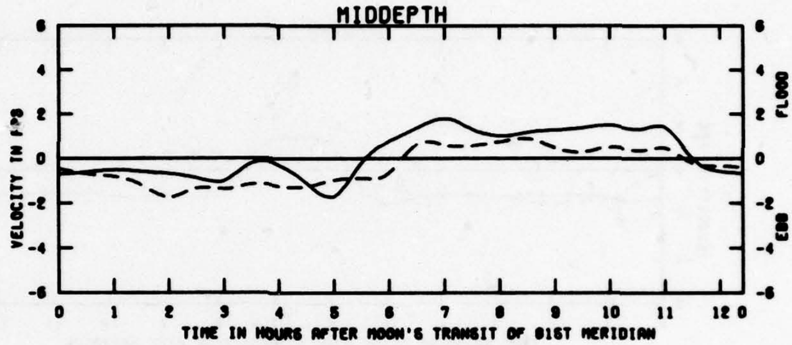
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	6040.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
7B

PLATE 82



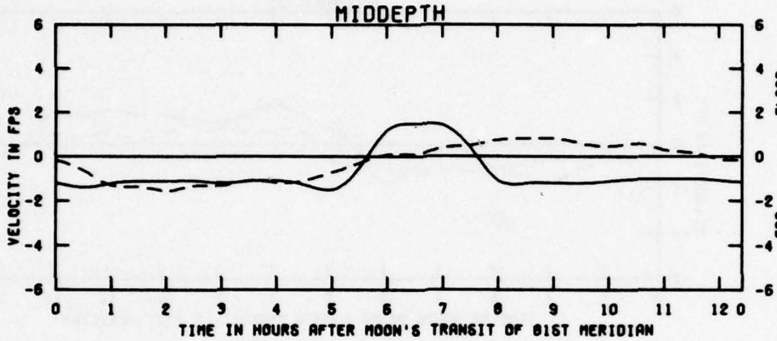
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
7C



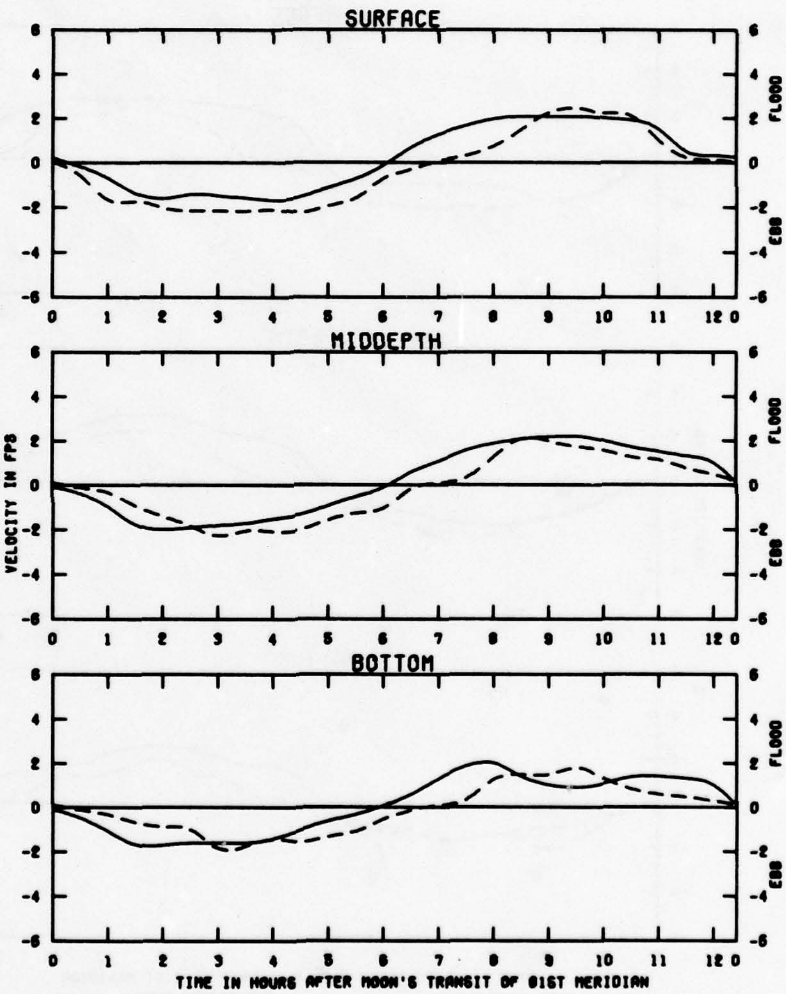
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	35.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
70



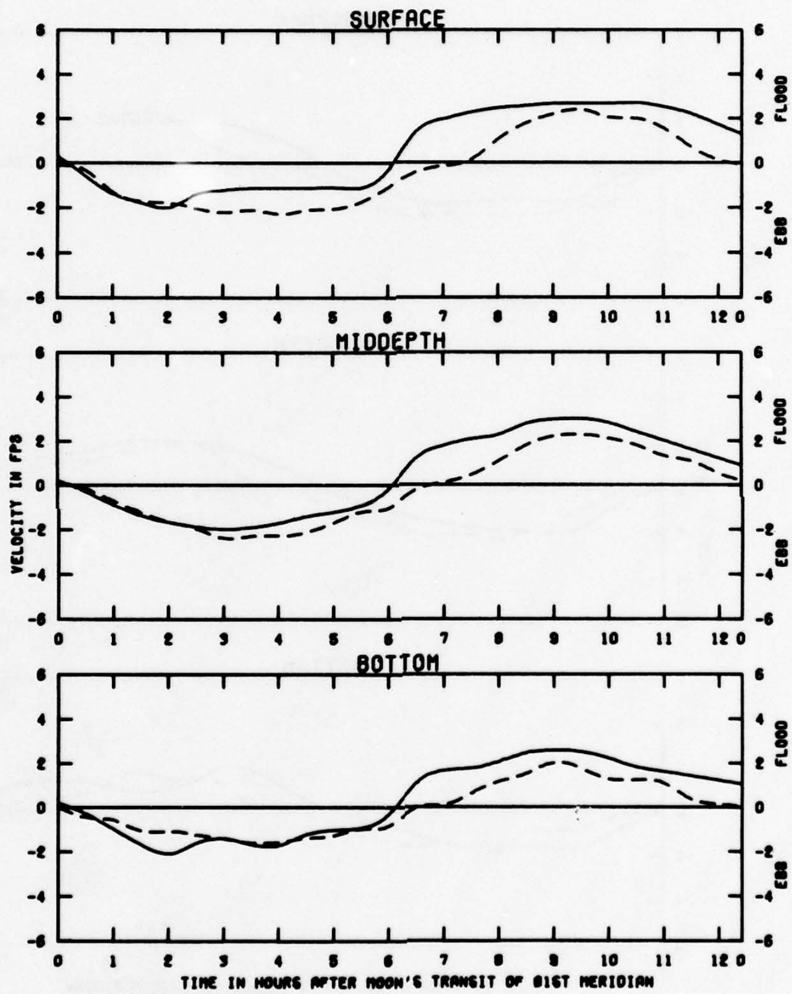
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	6940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION
8A

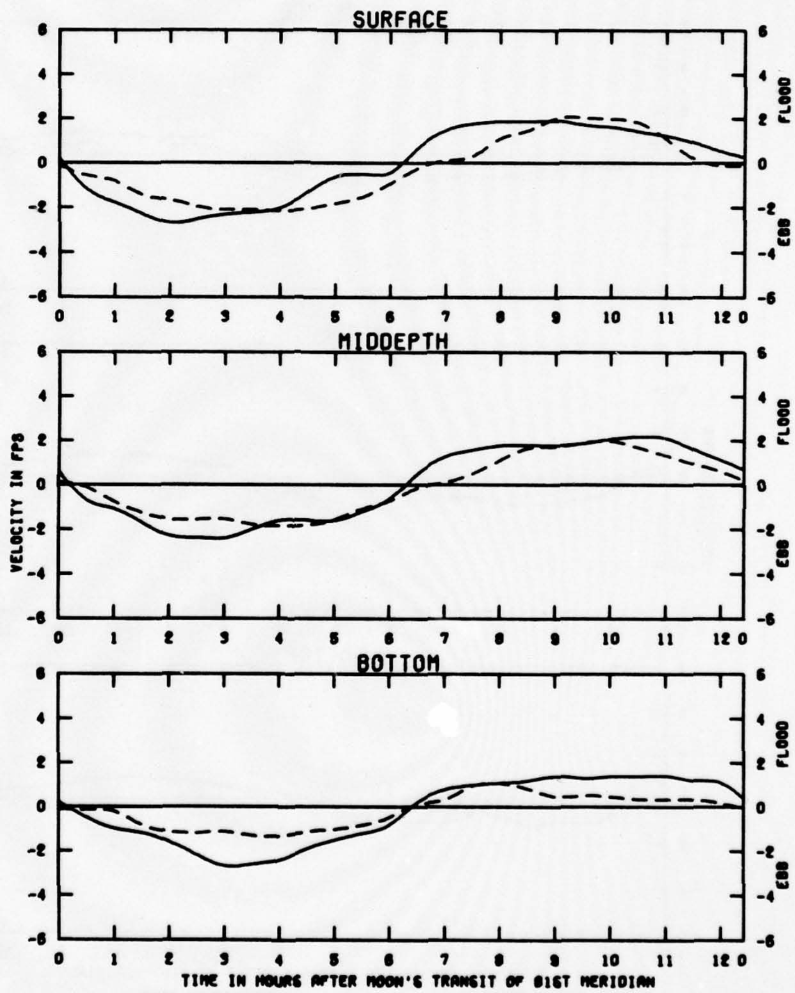


TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
68

LEGEND
PROTOTYPE ———
MODEL — — —



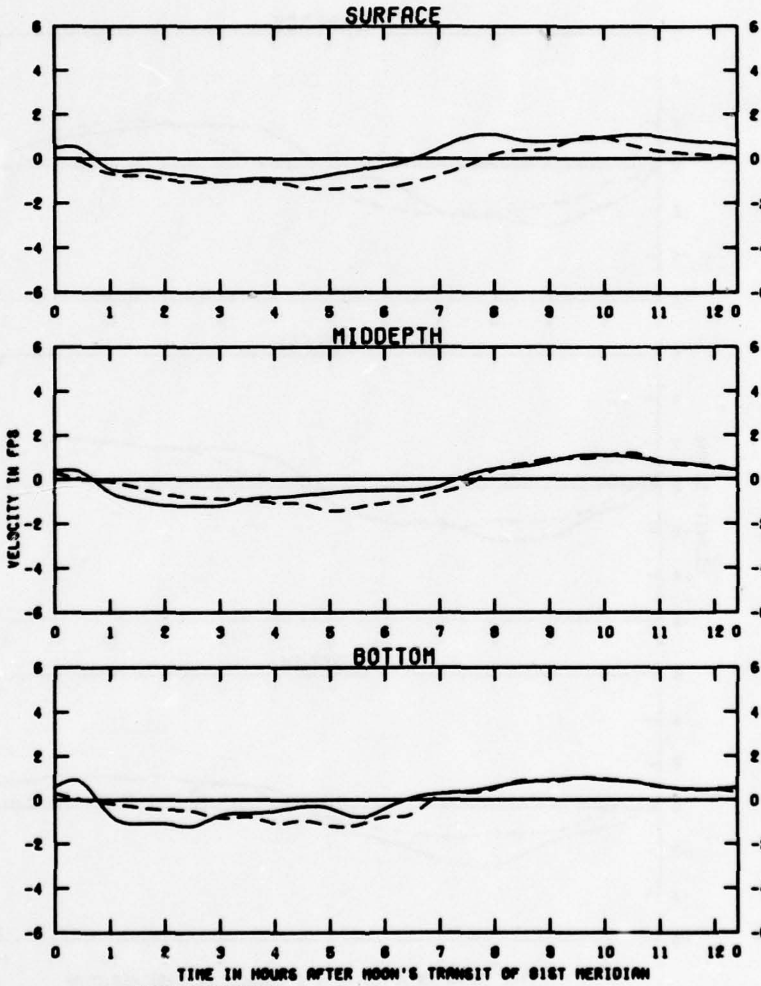
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
8C



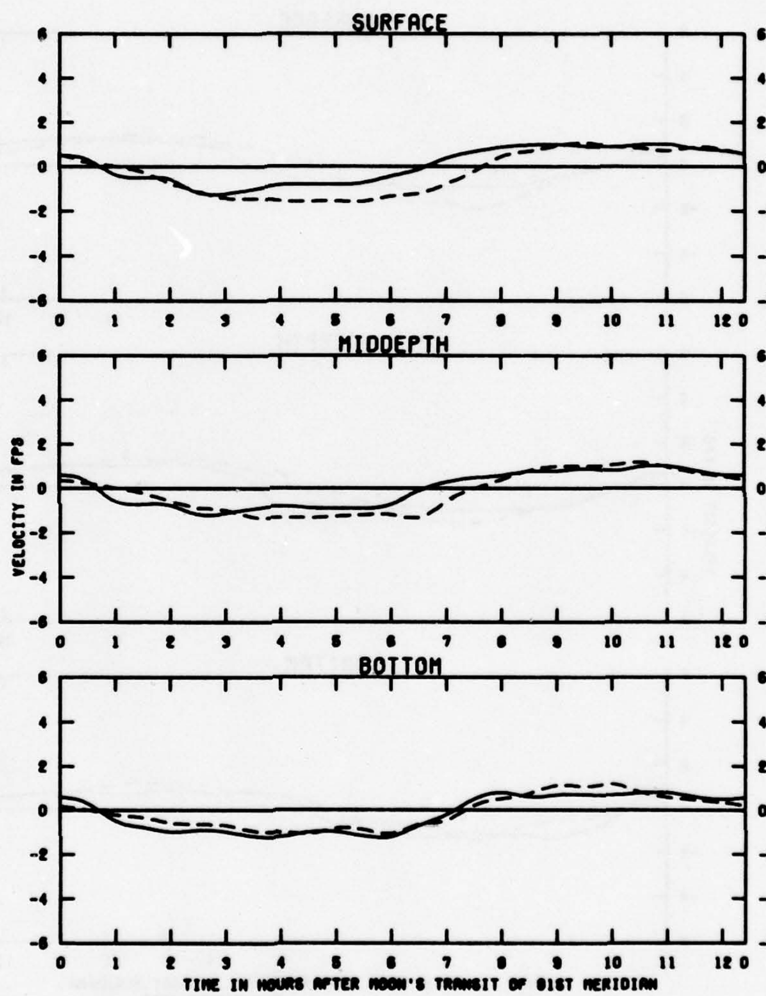
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
9A



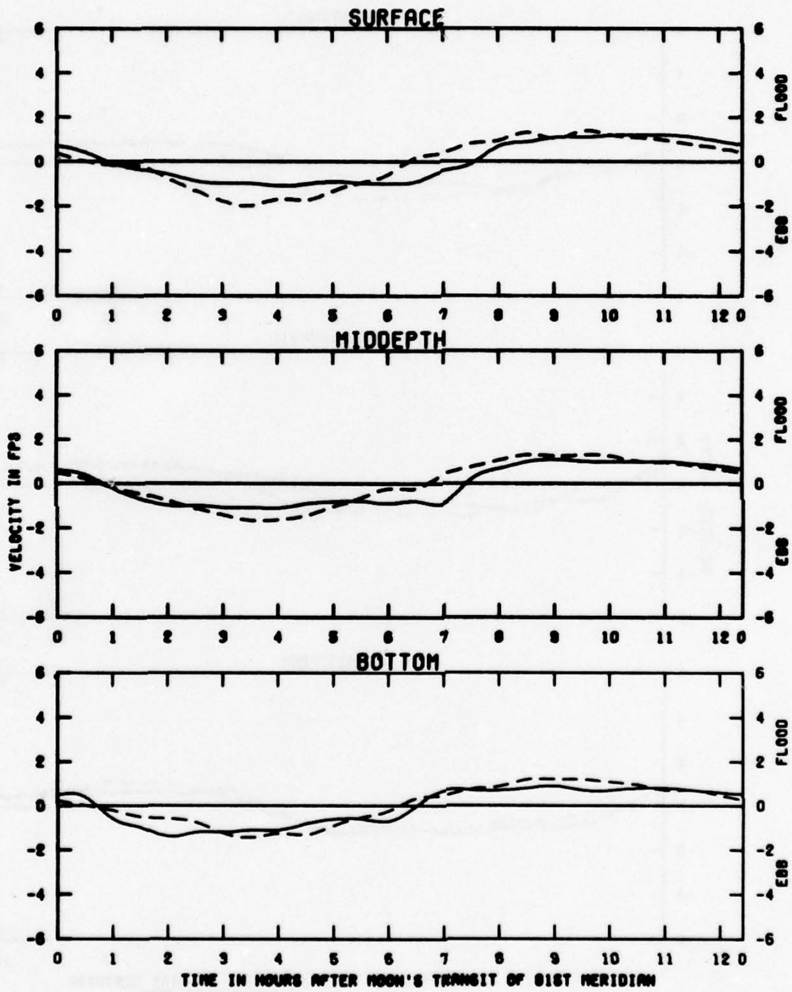
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

LEGEND
PROTOTYPE ——
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION
38



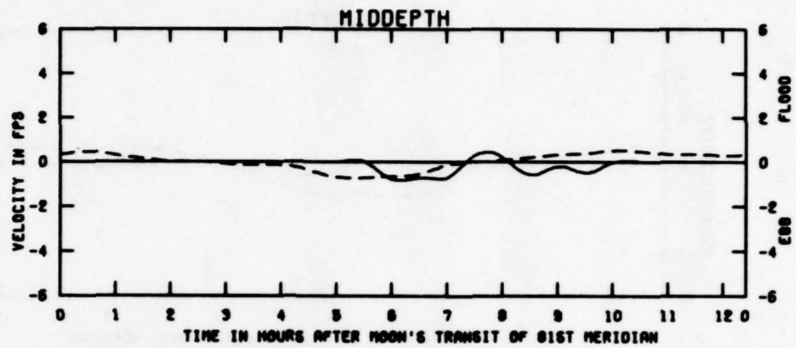
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION
SC



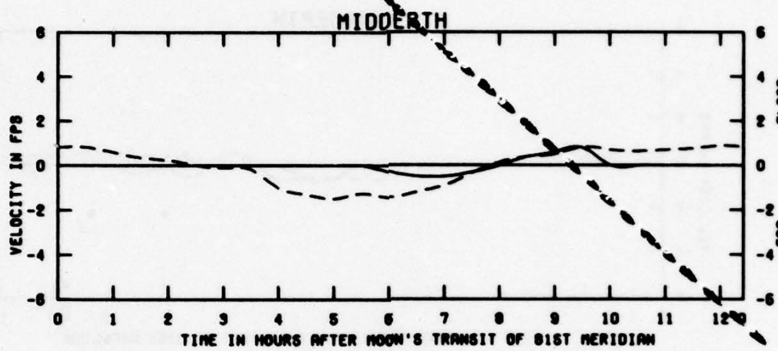
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION 10A



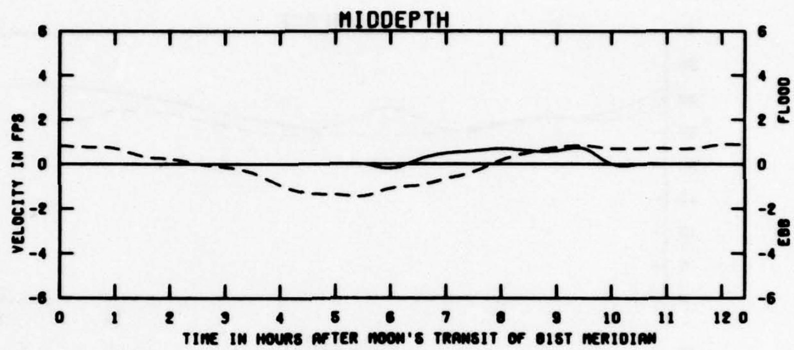
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
VELOCITIES
FOR 11-7-74 TIDE

STATION
108



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

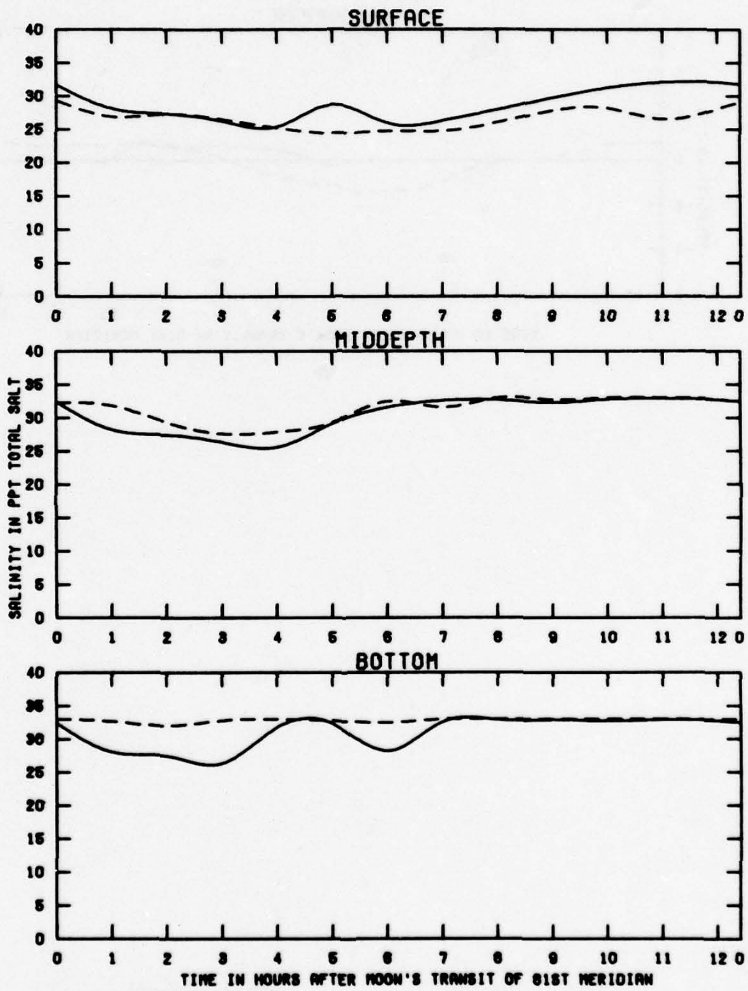
LEGEND

PROTOTYPE ———

MODEL – – –

VERIFICATION OF VELOCITIES FOR 11-7-74 TIDE

STATION 10C



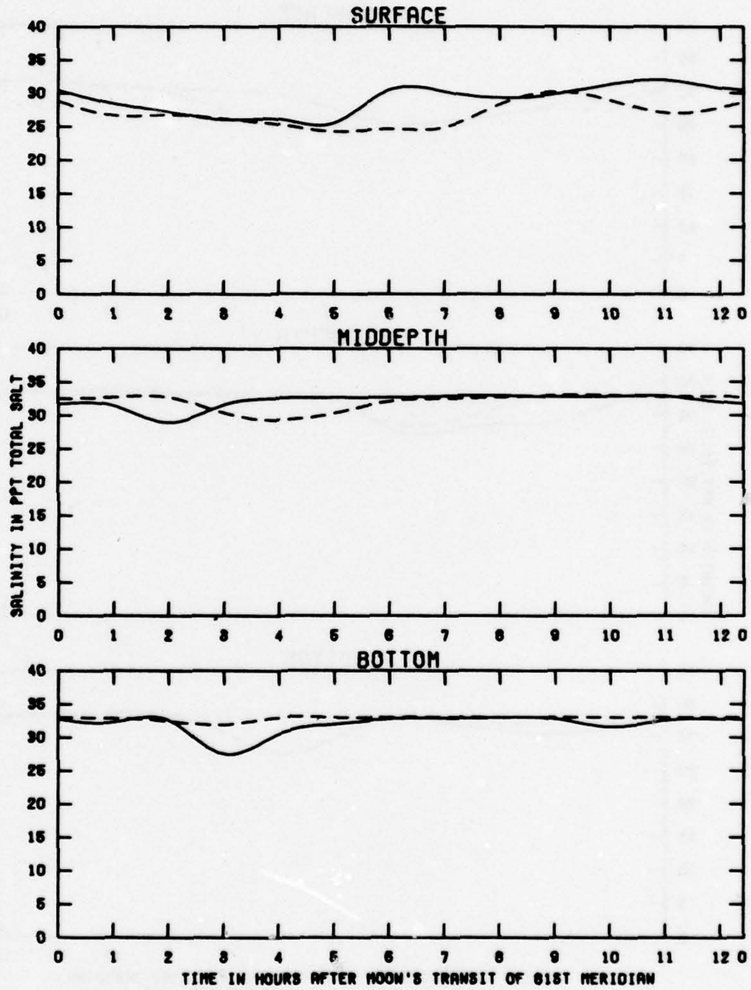
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 4.3 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2860.0 CFS

VERIFICATION OF
SALINITIES
FOR 6-11-74 TIDE

LEGEND
PROTOTYPE ———
MODEL - - -

STATION
1A

PLATE 94



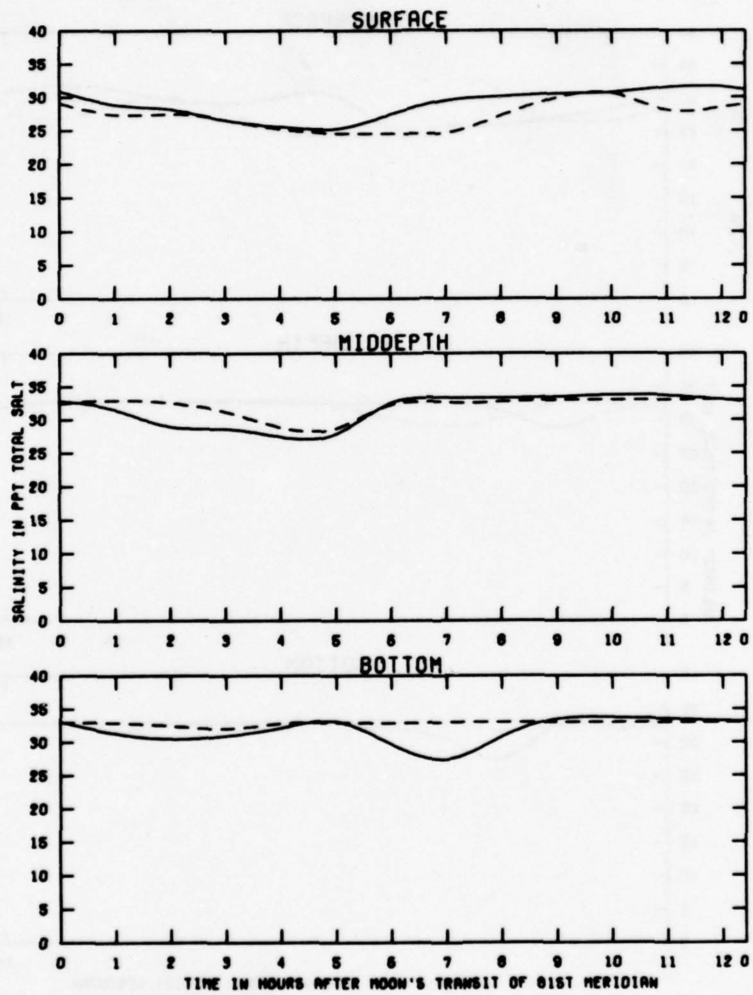
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 18

LEGEND
PROTOTYPE ———
MODEL – – –



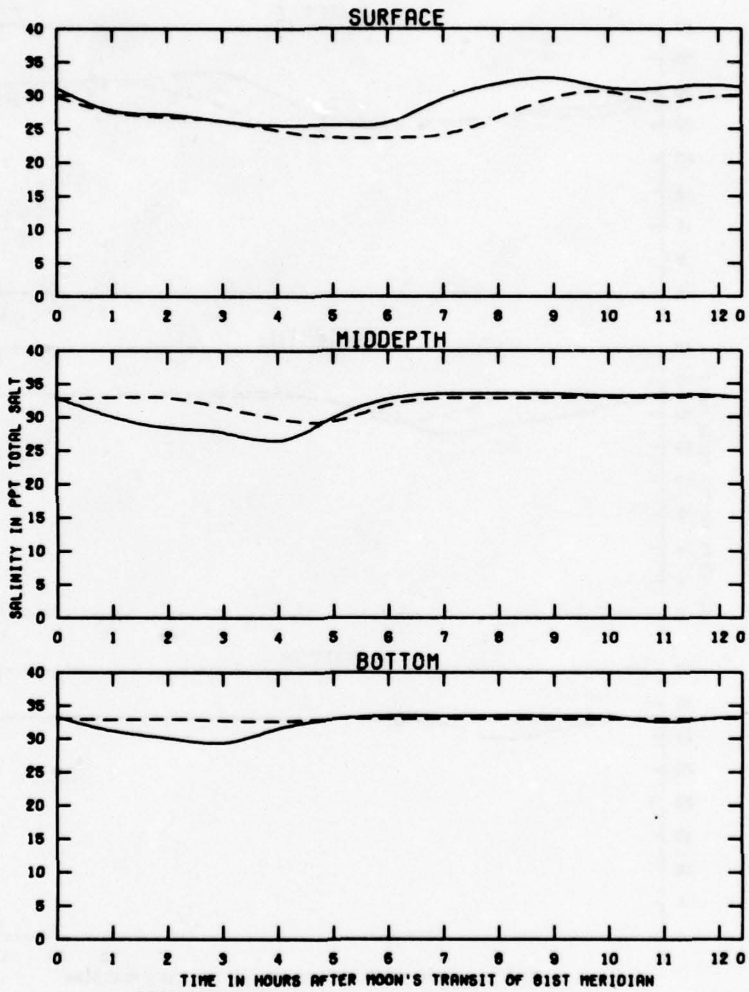
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

LEGEND
PROTOTYPE ———
MODEL – – –

STATION
1C



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2860.0	CFS

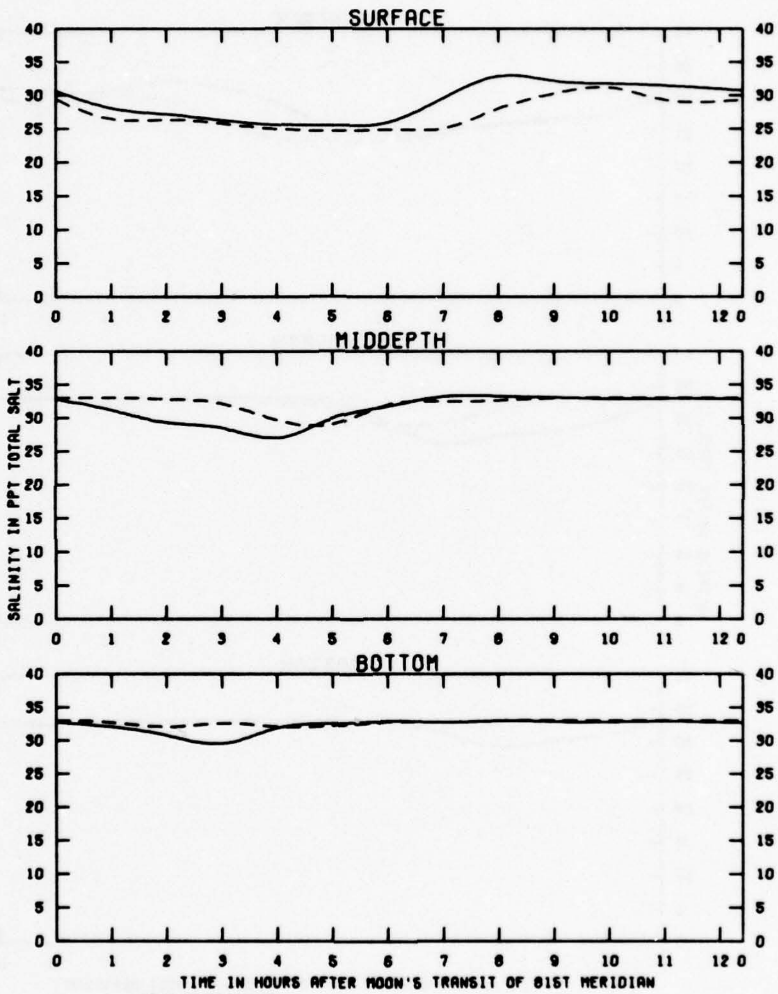
LEGEND

PROTOTYPE ———

MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-11-74 TIDE

STATION
10



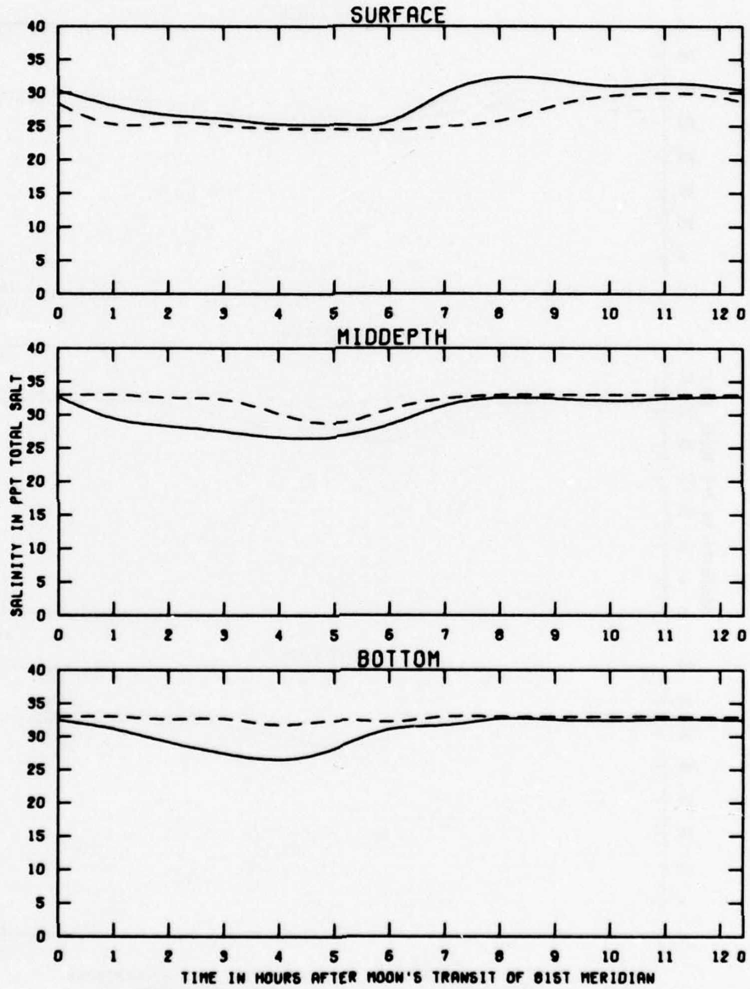
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

LEGEND
PROTOTYPE ———
MODEL – – –

STATION
1E



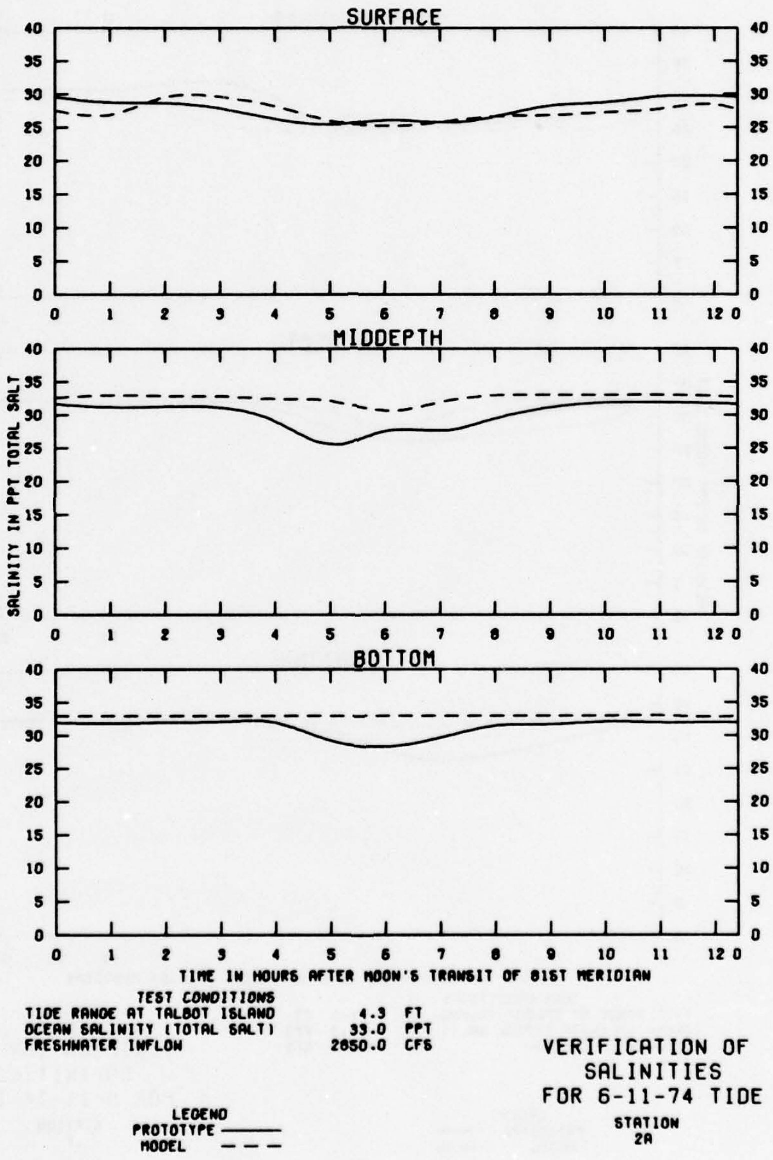
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

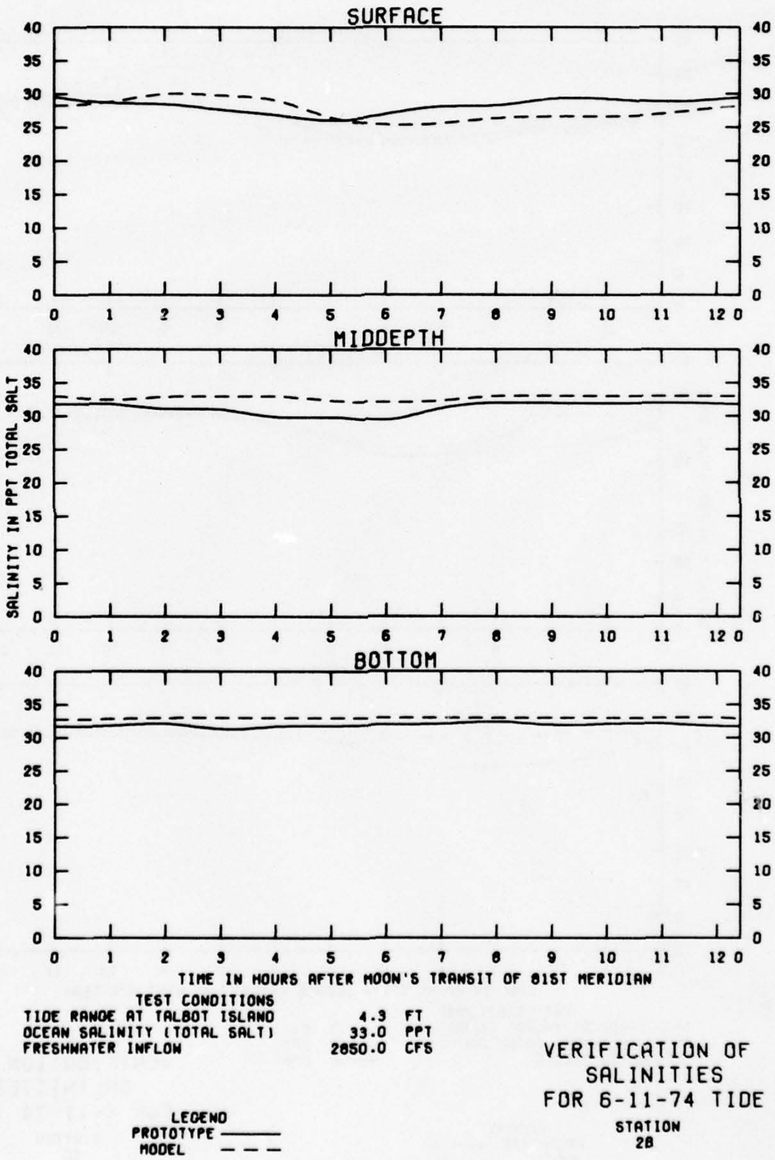
VERIFICATION OF
SALINITIES
FOR 6-11-74 TIDE

STATION
1F



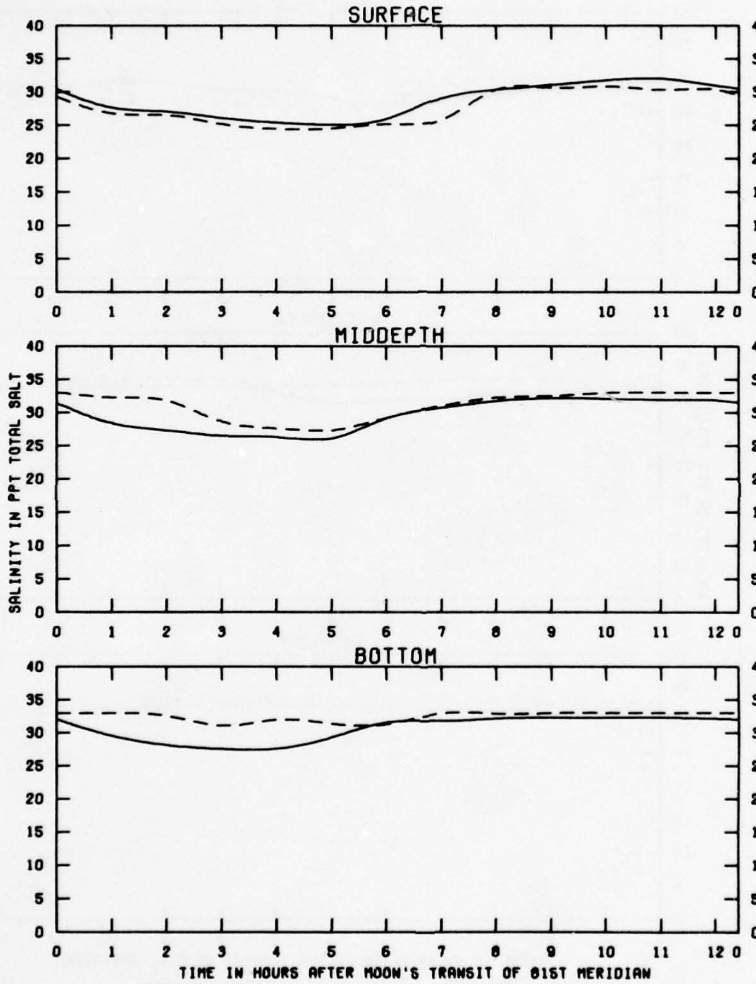
VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 2A



VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 2B



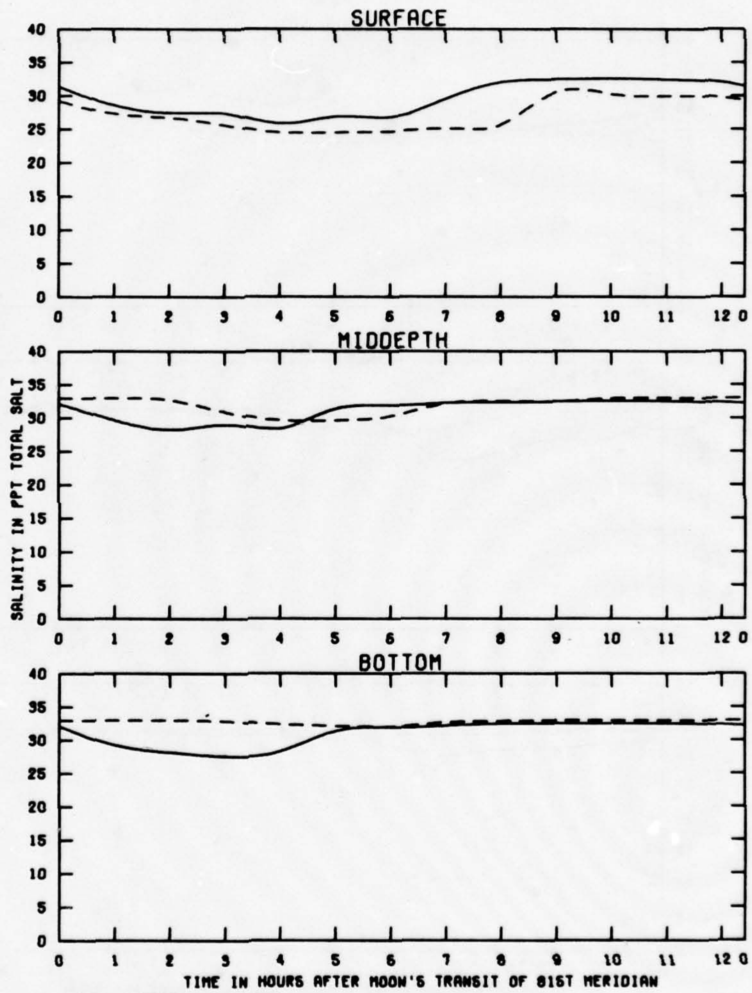
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 2C



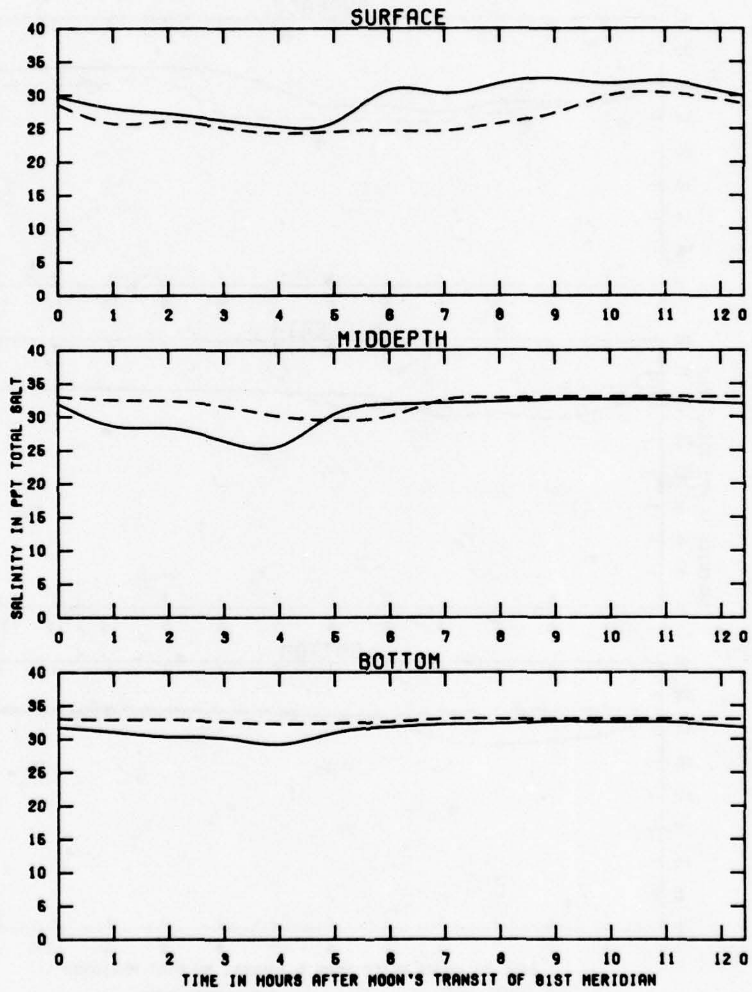
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 2D



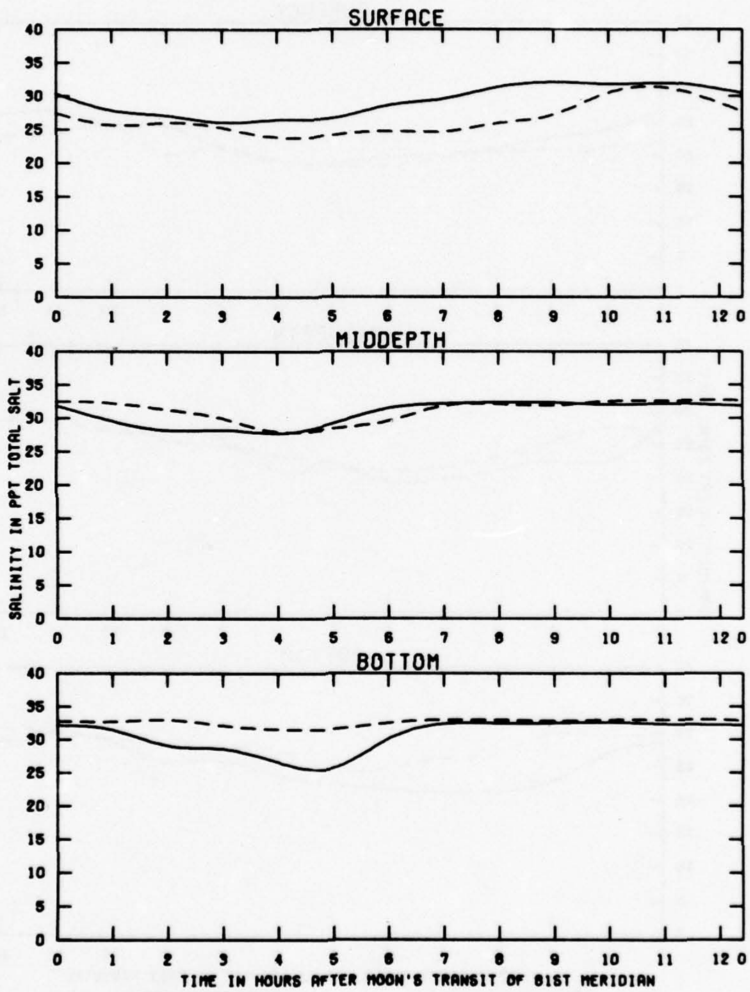
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-11-74 TIDE

STATION
2E



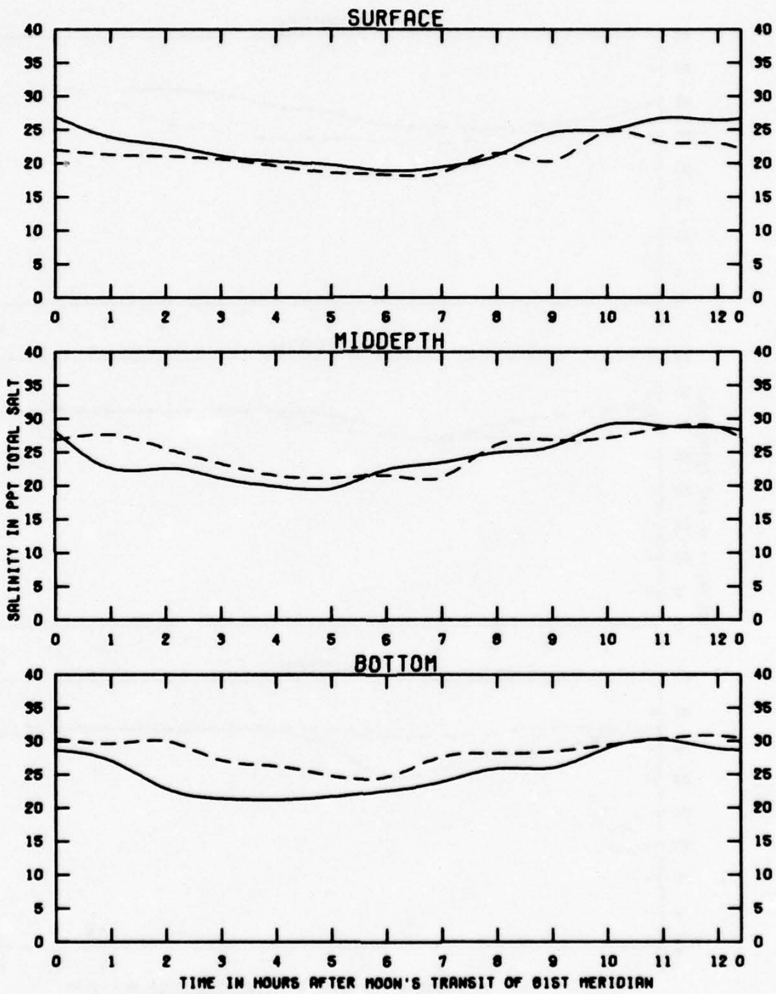
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 2F



TEST CONDITIONS

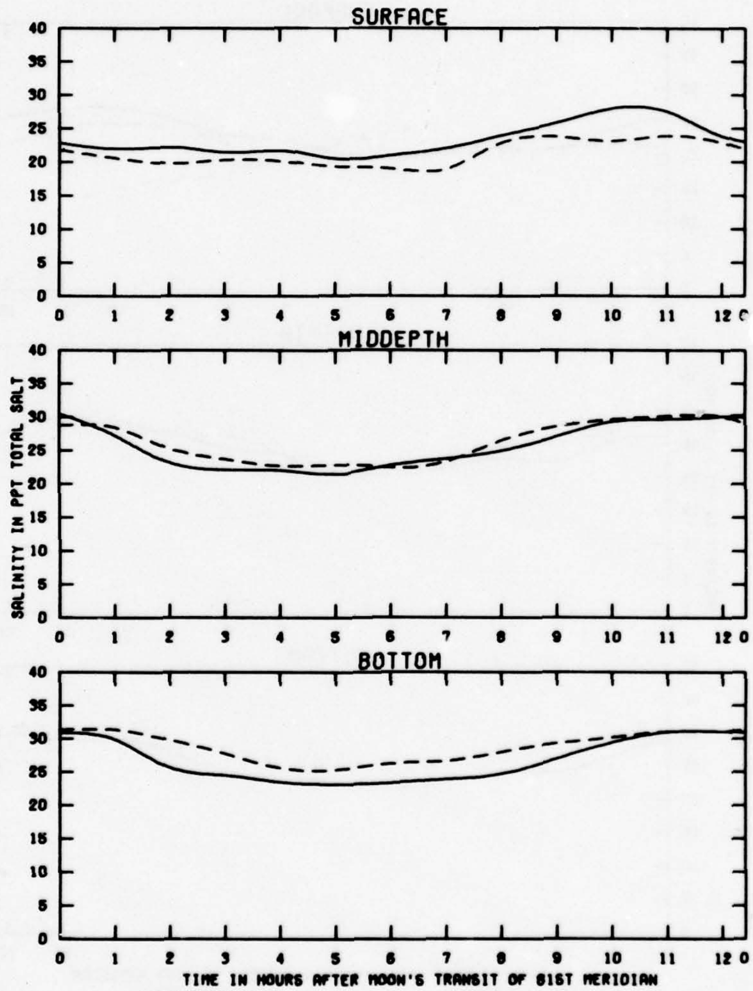
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 3A

PLATE 106



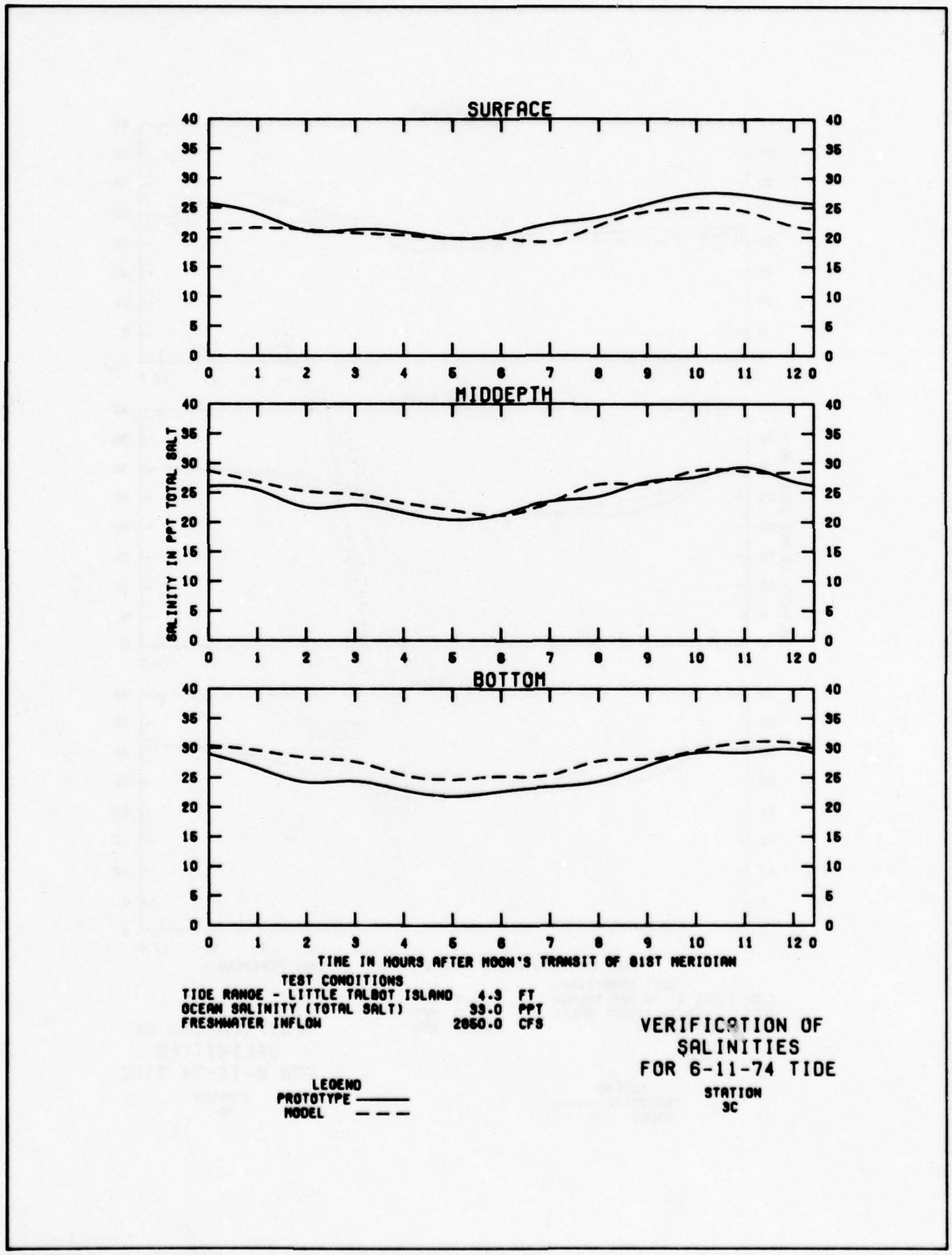
TEST CONDITIONS

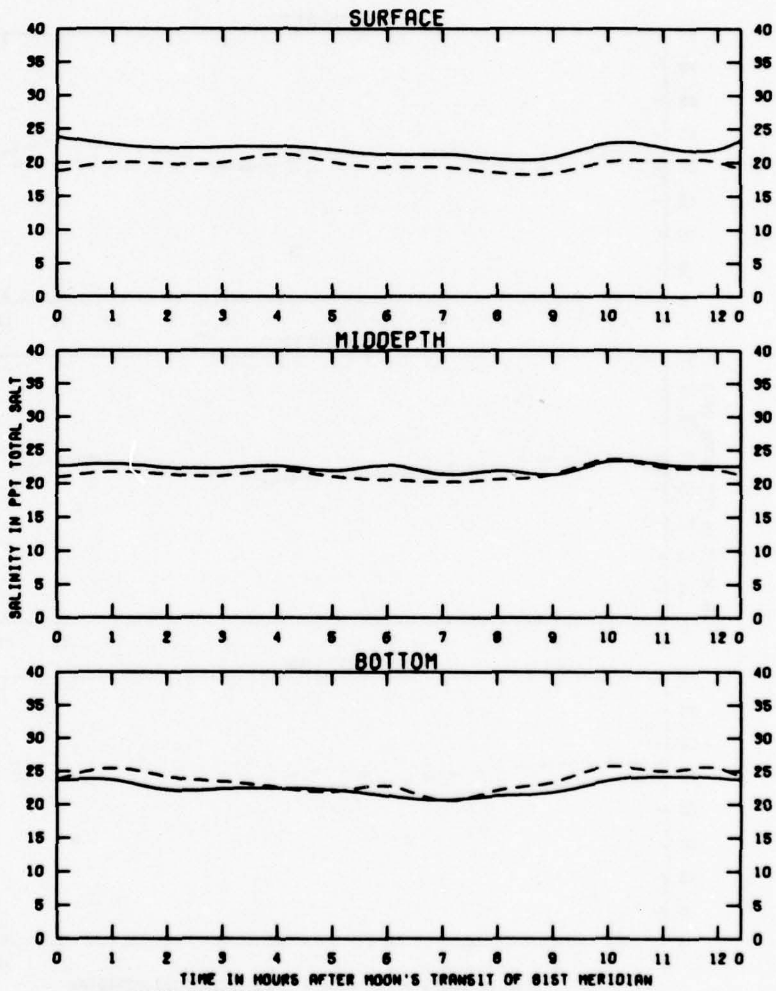
TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-11-74 TIDE

STATION
38


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 4.3 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2850.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
SALINITIES
FOR 6-11-74 TIDE
STATION
3C



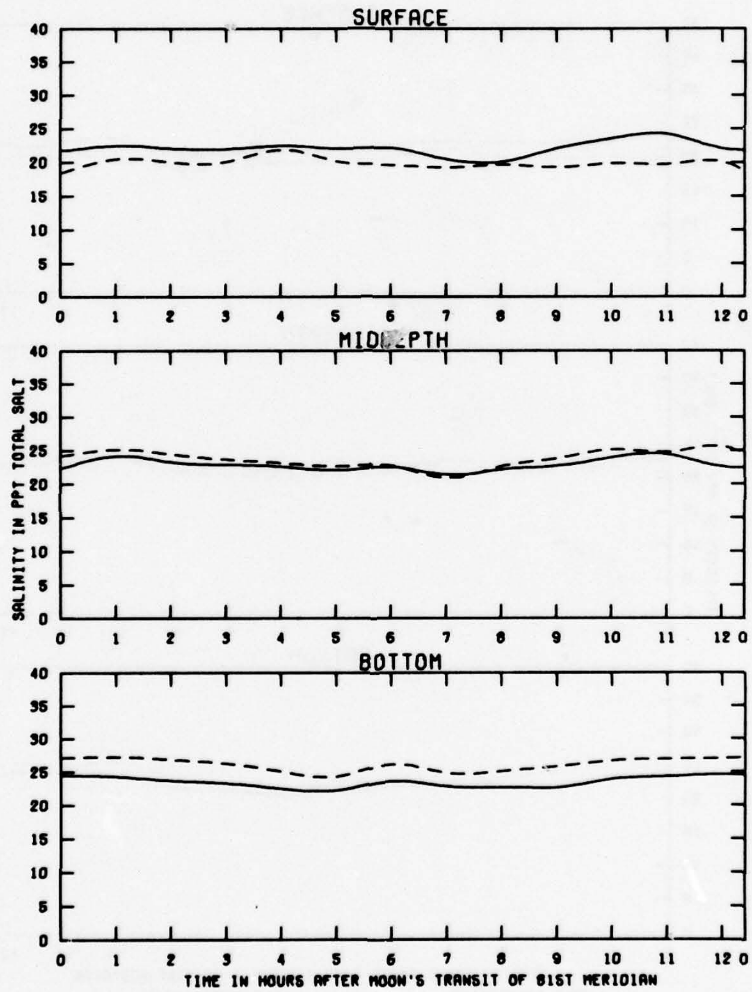
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 4A



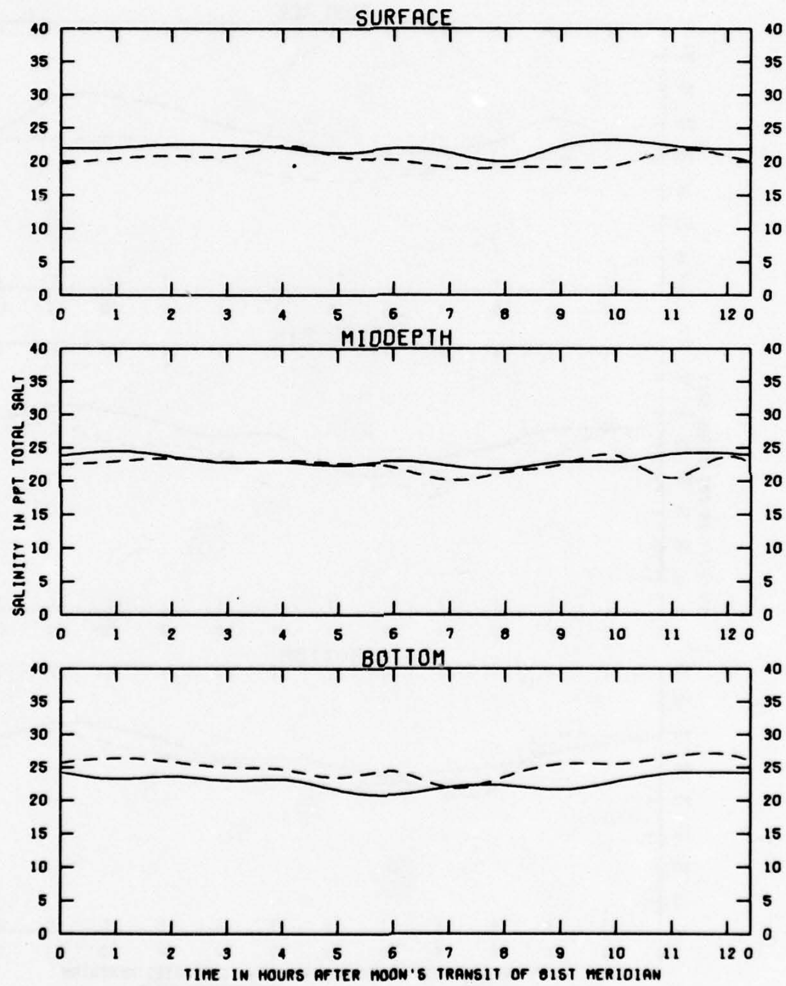
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ——
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION
48



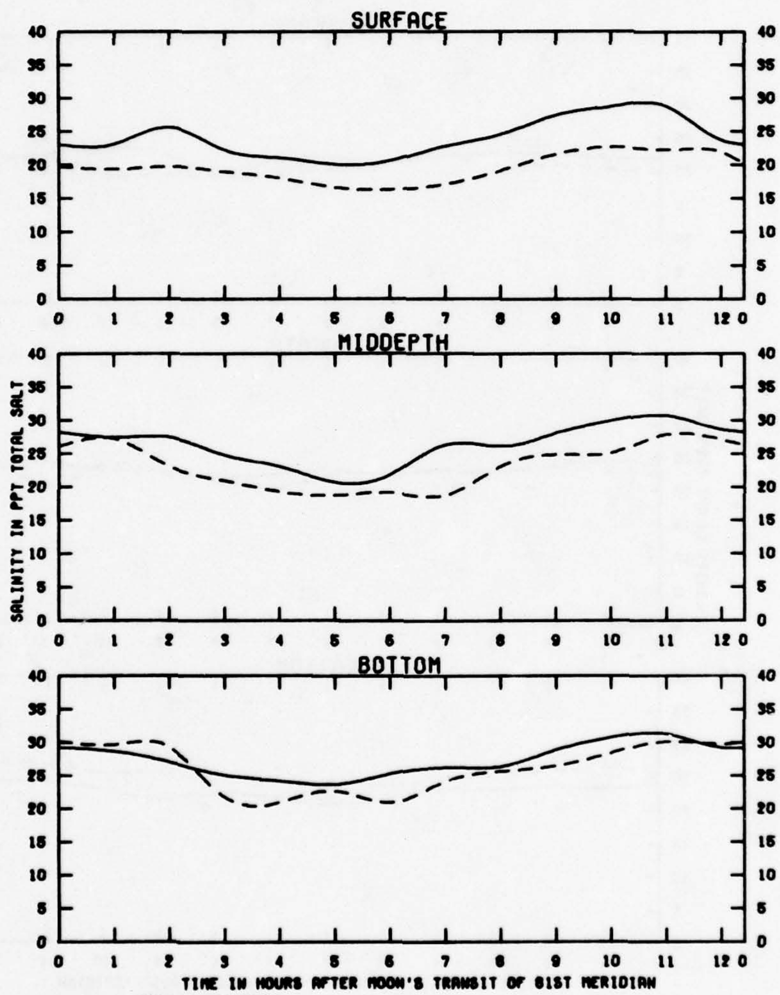
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.3	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF SALINITIES FOR 6-11-74 TIDE

STATION 4C



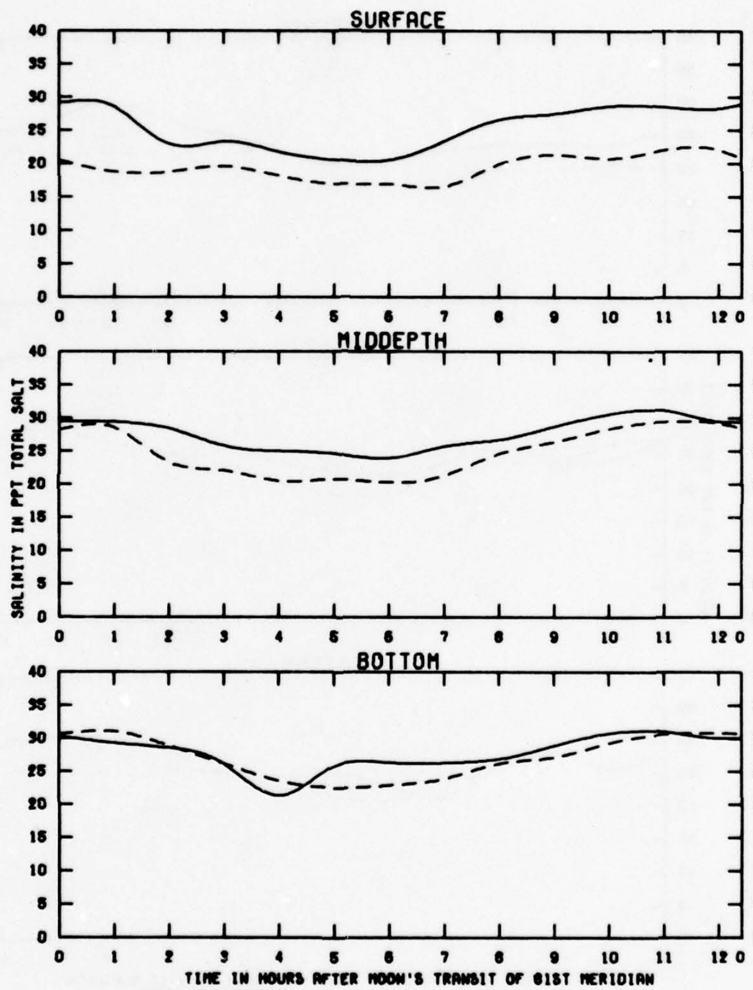
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
3A



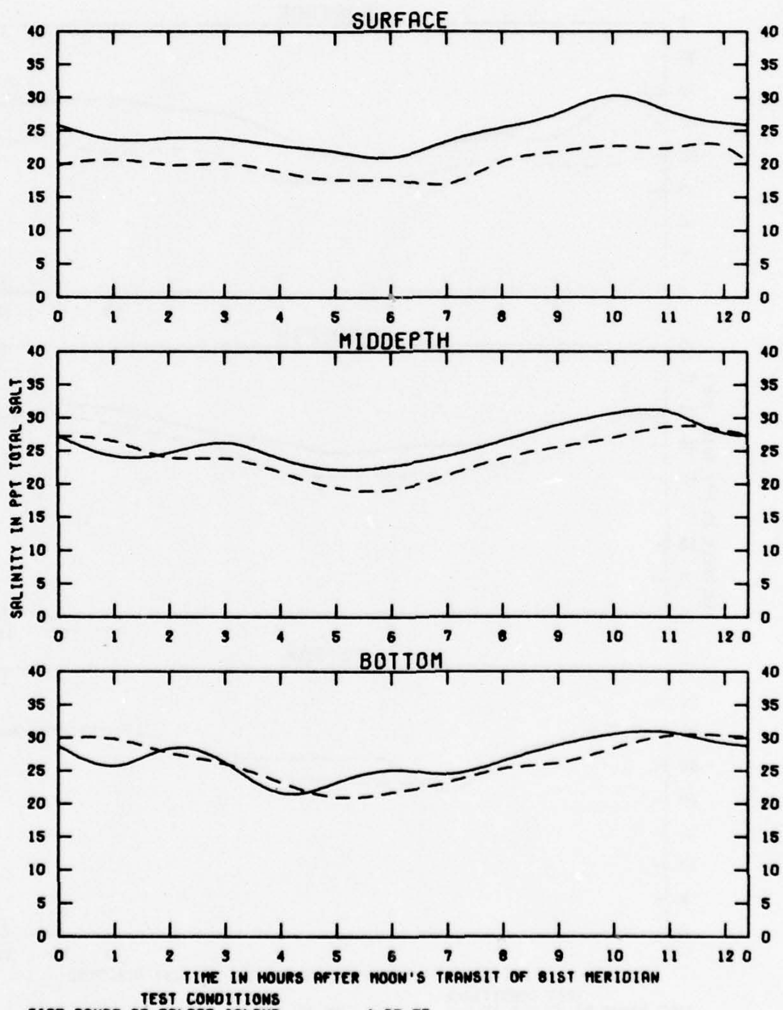
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
38



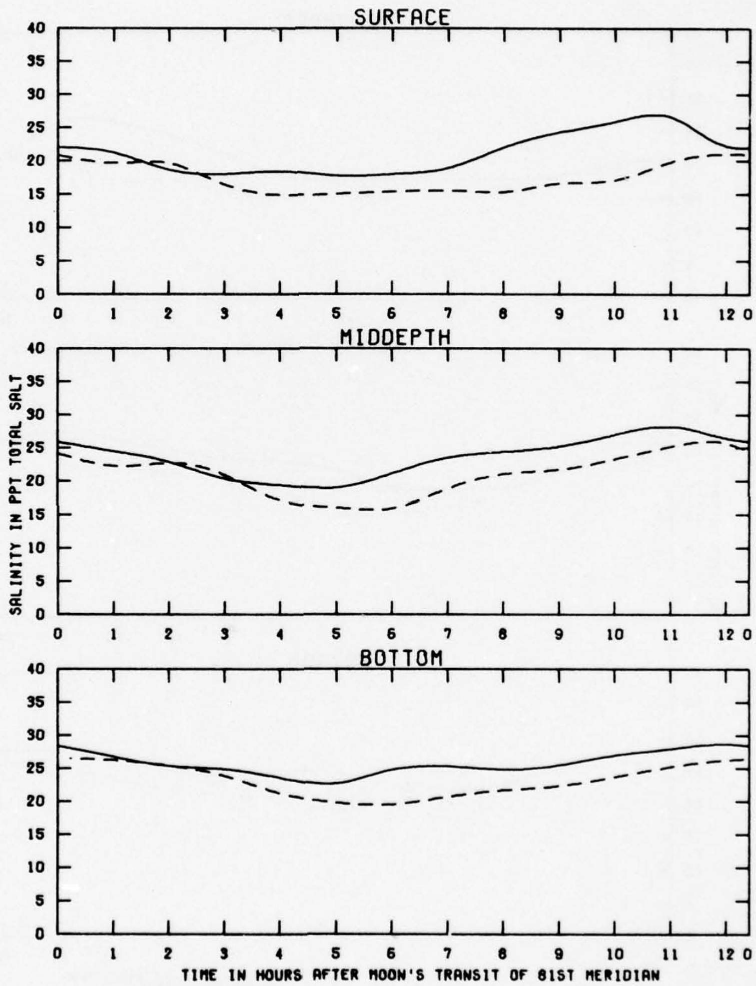
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ————
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 3C



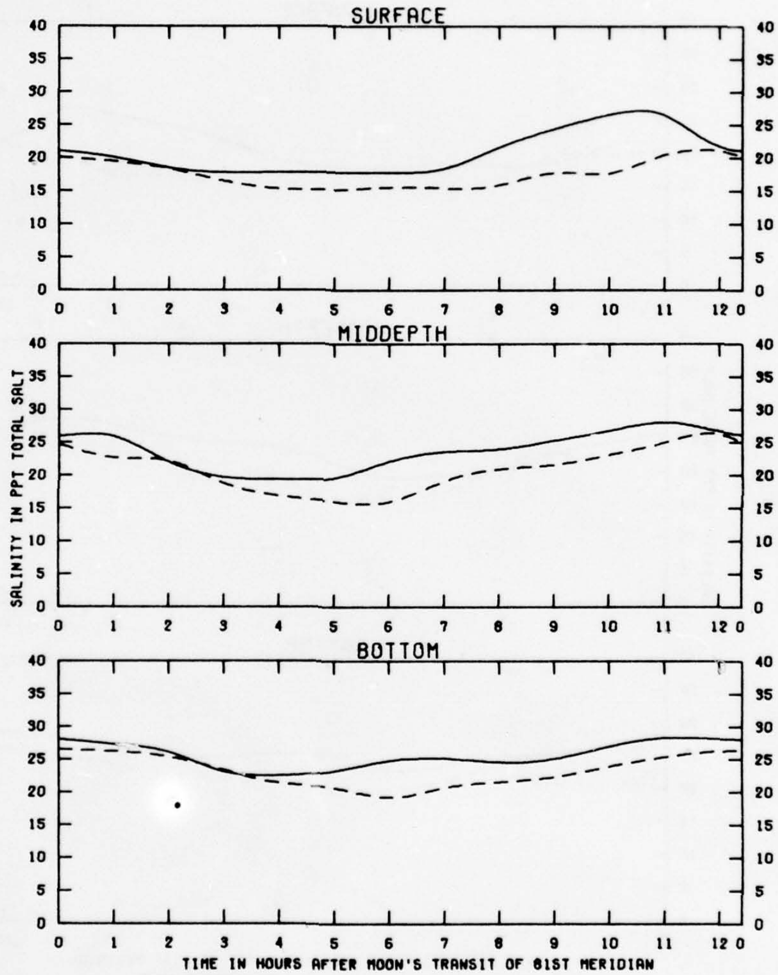
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 5A

LEGEND
PROTOTYPE ————
MODEL – – –



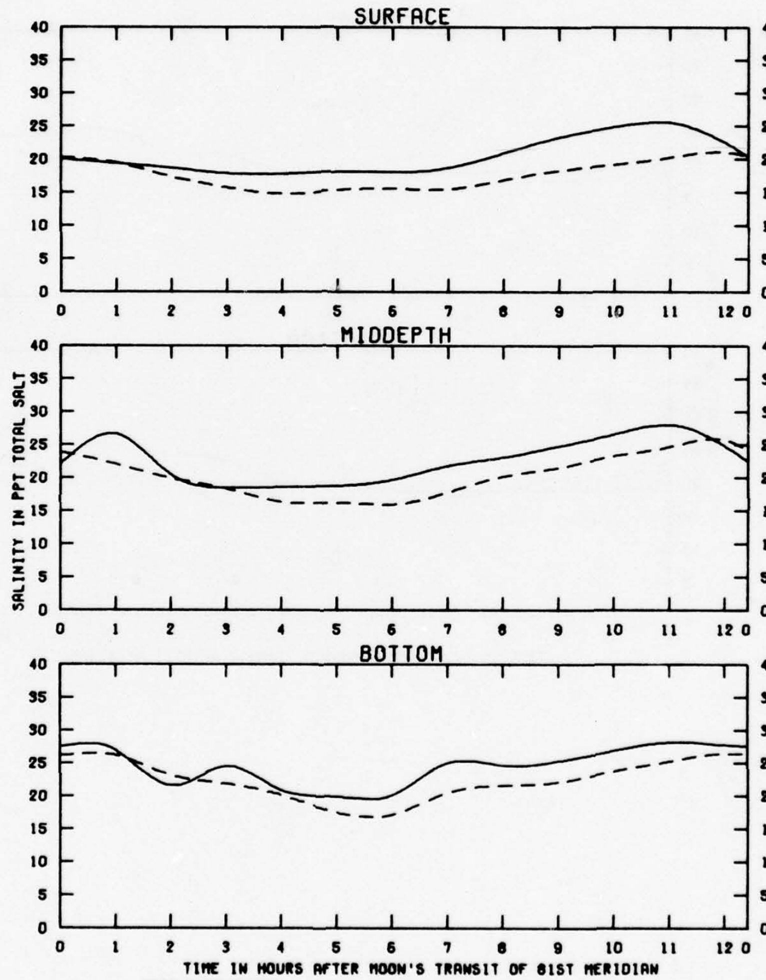
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 58



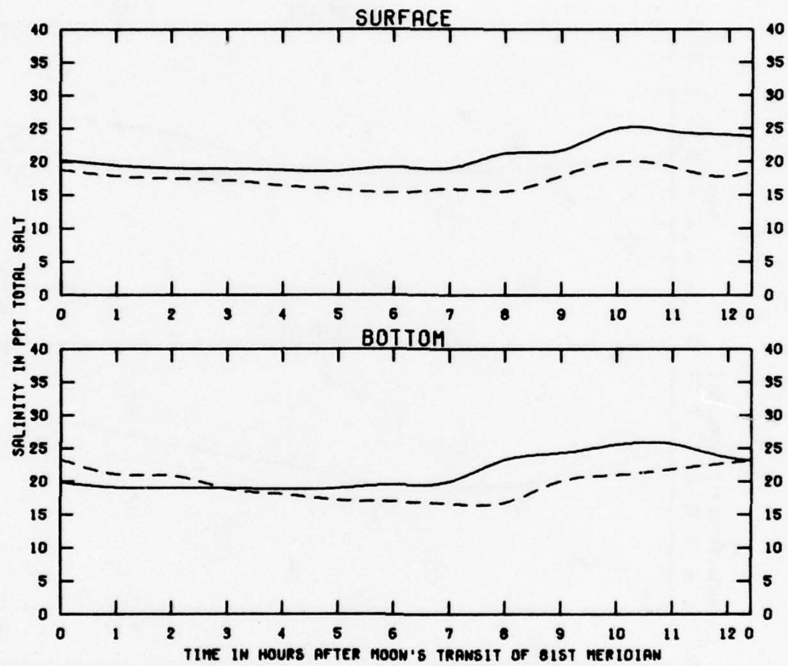
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 5C



TEST CONDITIONS

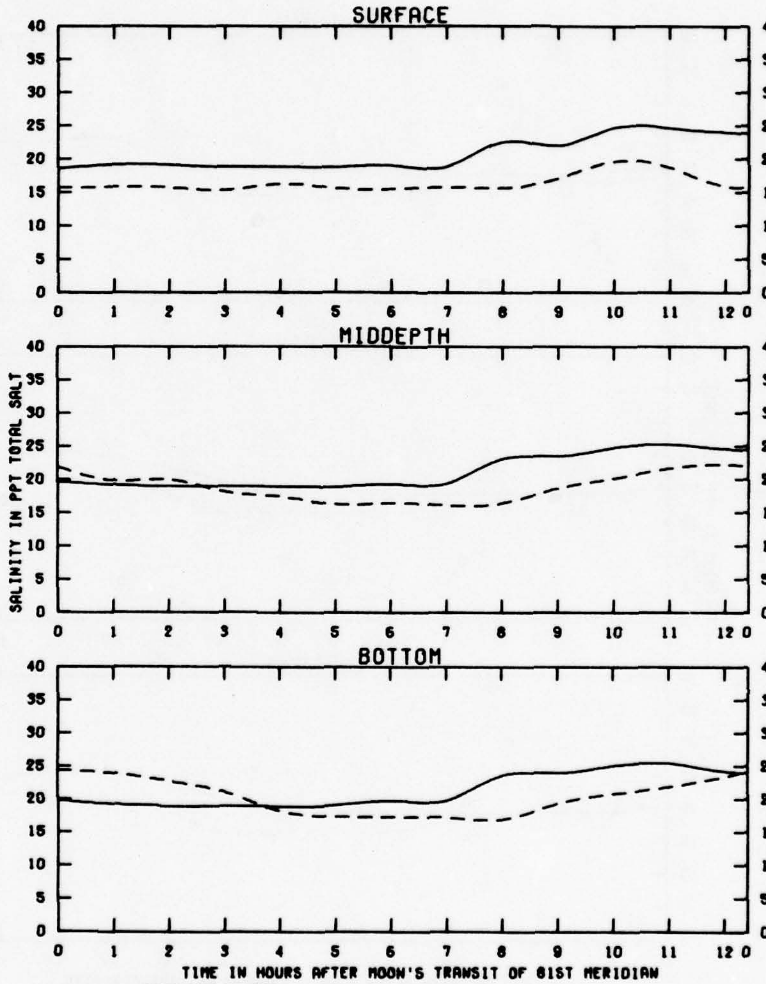
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 6A

PLATE 118



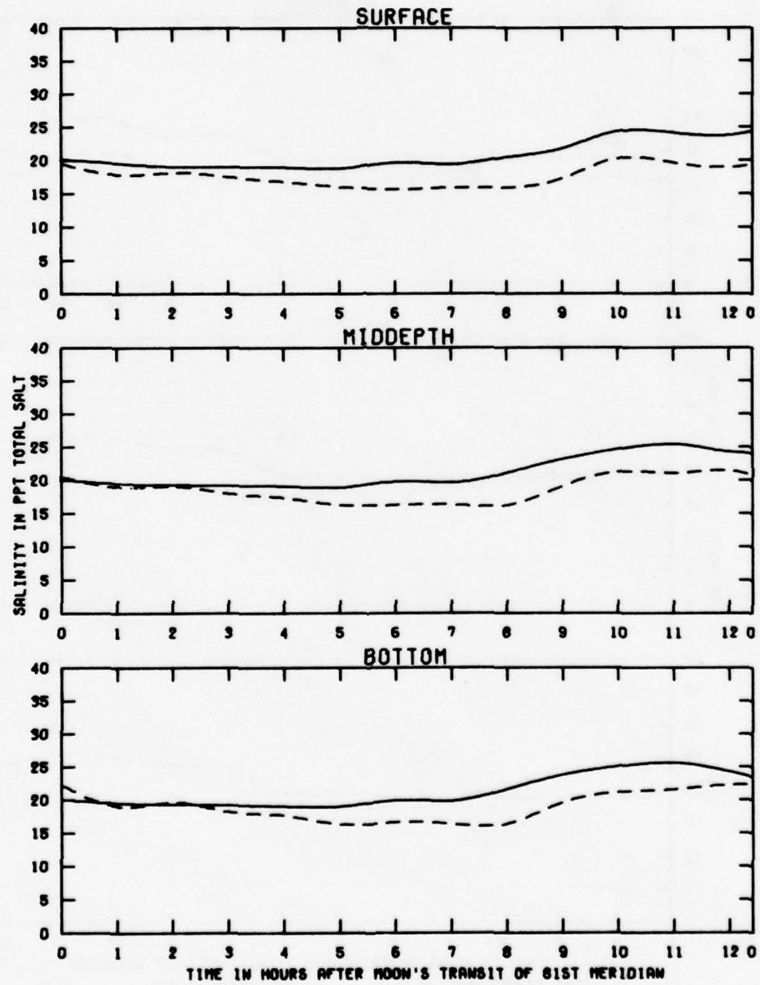
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 68



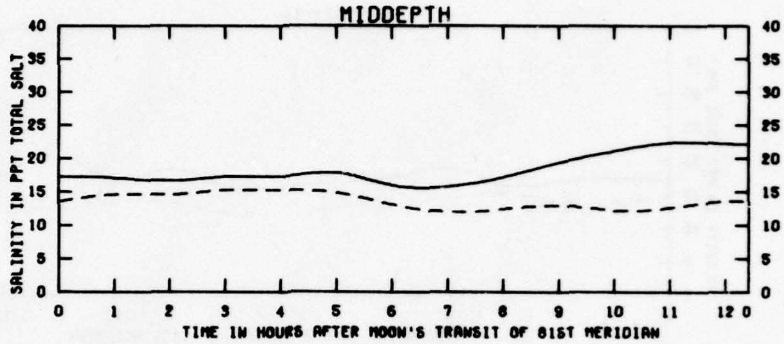
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION
6C



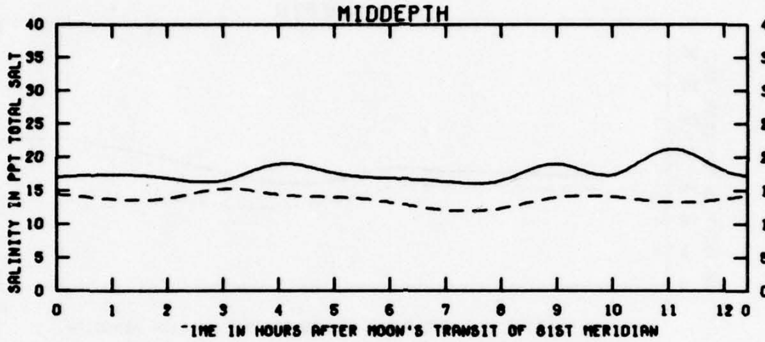
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
7A



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2650.0	CFS

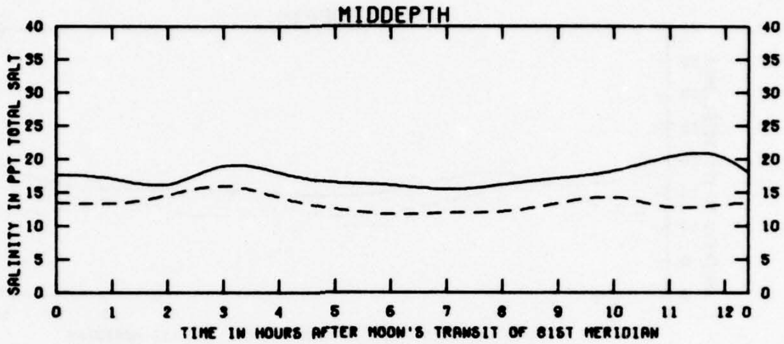
LEGEND

PROTOTYPE ———

MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 78



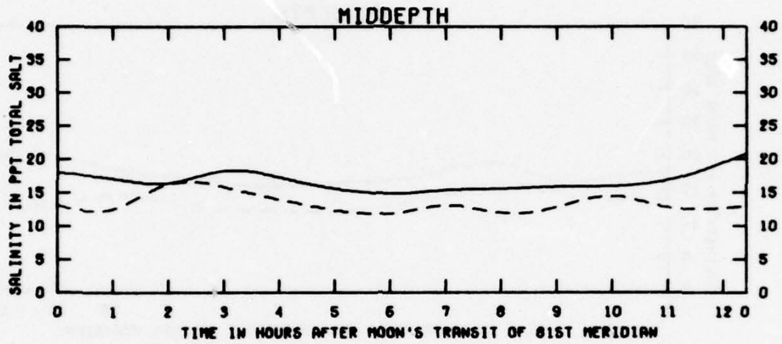
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 7C



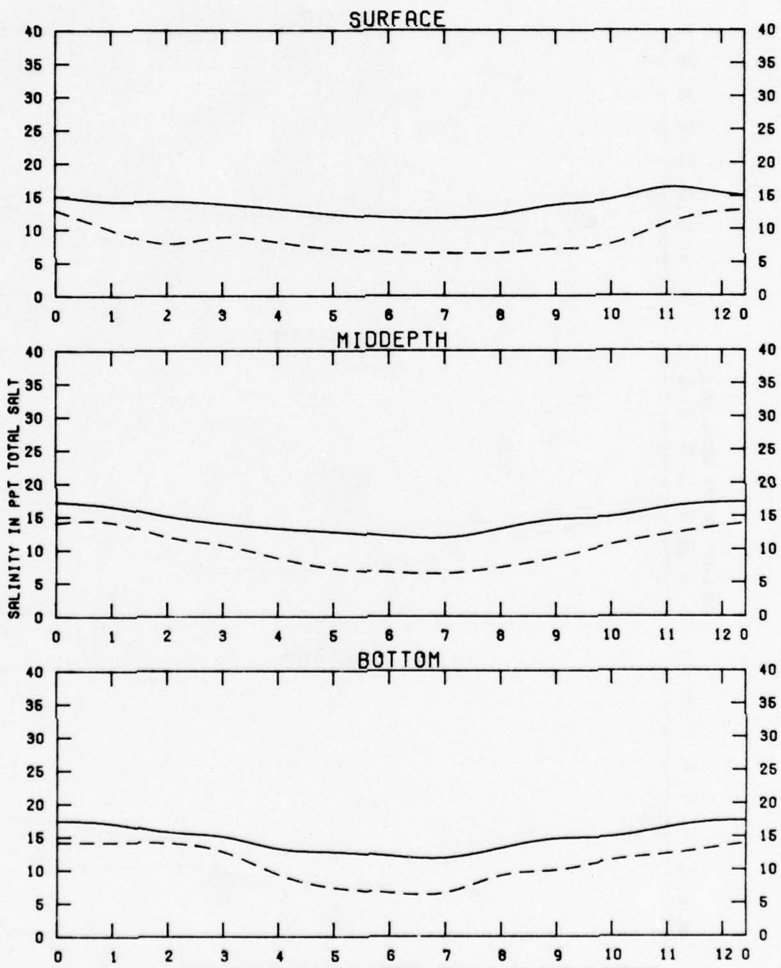
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
7D



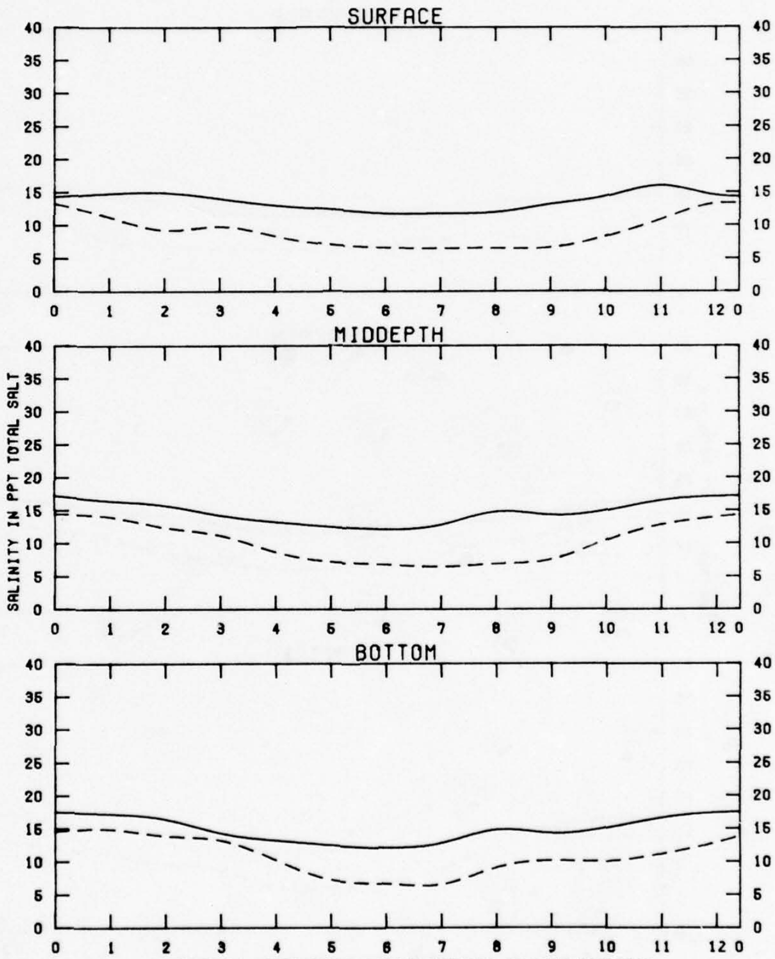
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 4.65 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2850.0 CFS

LEGEND
PROTOTYPE ———
MODEL — — -·-

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 8A



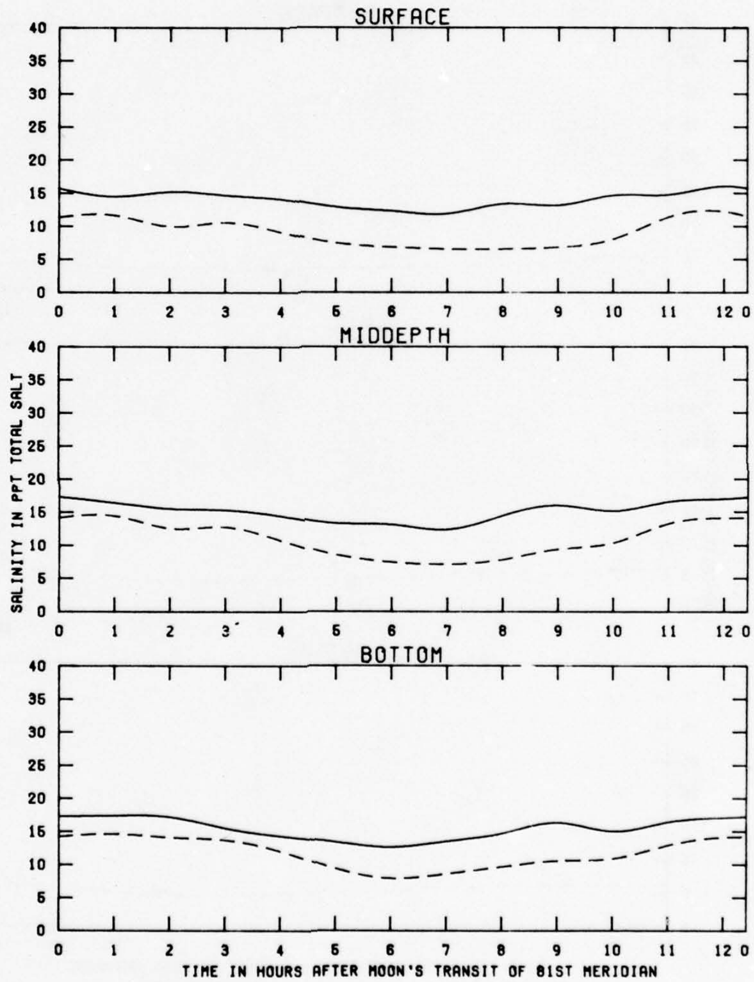
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 4.65 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2850.0 CFS

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 8B

LEGEND
PROTOTYPE ———
MODEL – – –

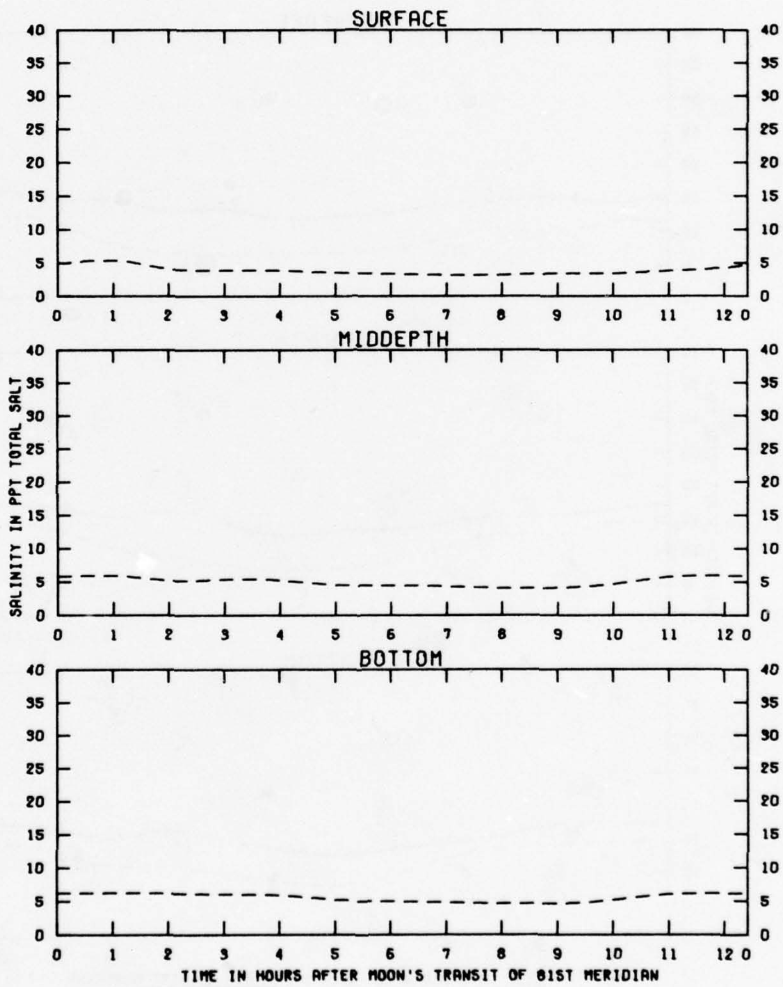


TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 4.65 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 2850.0 CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
8C



TEST CONDITIONS

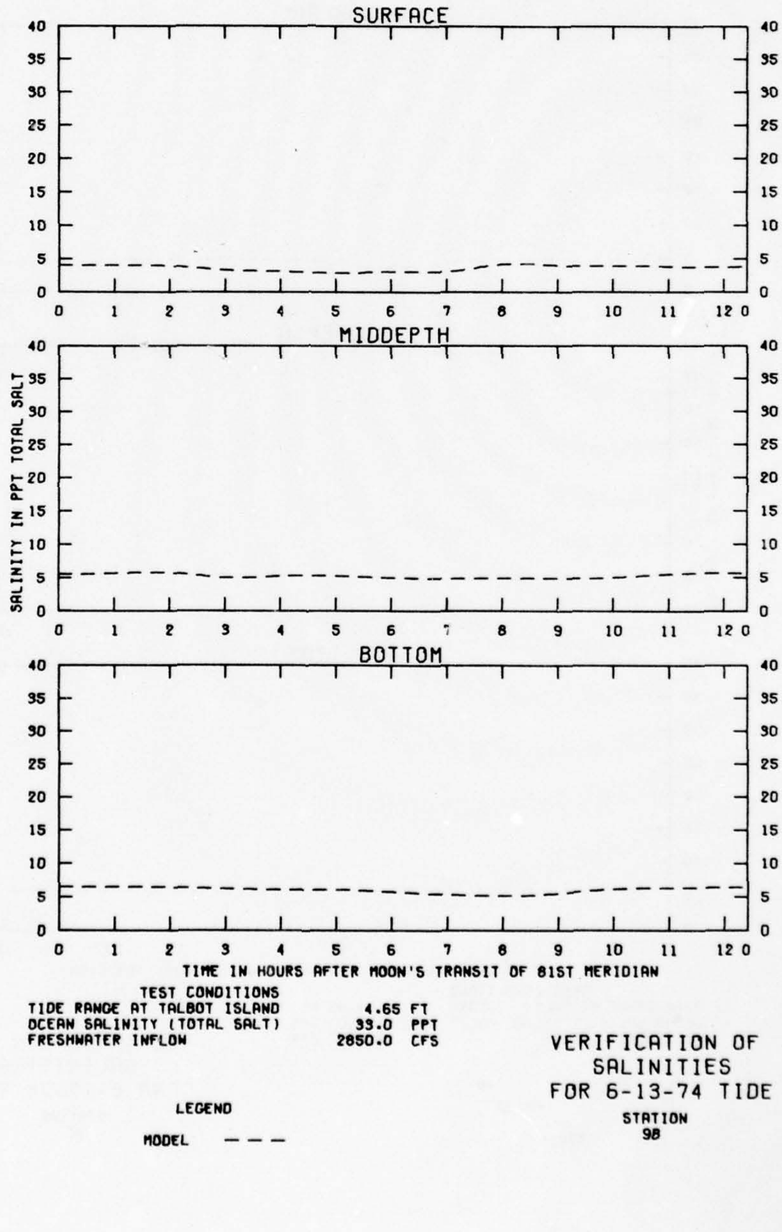
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND

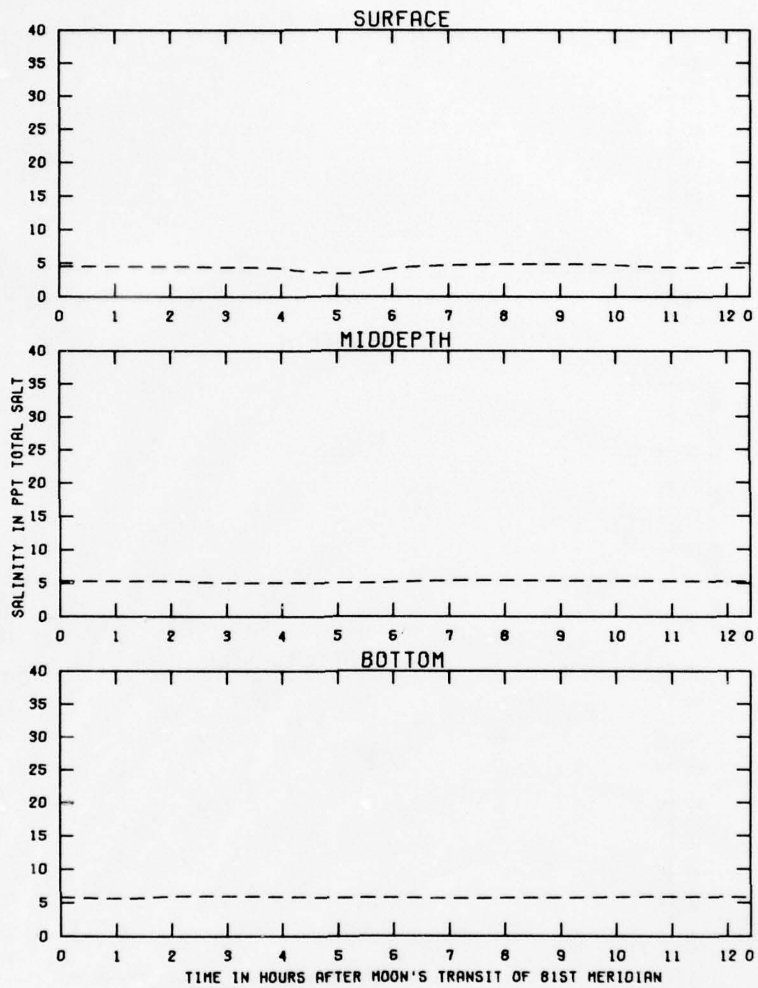
MODEL — — —

VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
9A



VERIFICATION OF SALINITIES FOR 6-13-74 TIDE



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

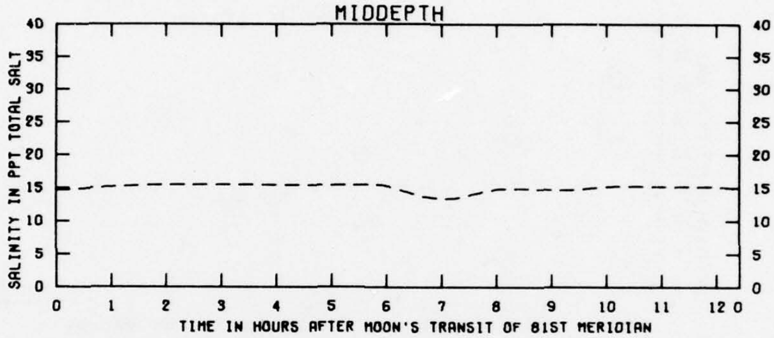
VERIFICATION OF
SALINITIES
FOR 6-13-74 TIDE

STATION
9C

LEGEND

MODEL — — —

PLATE 130



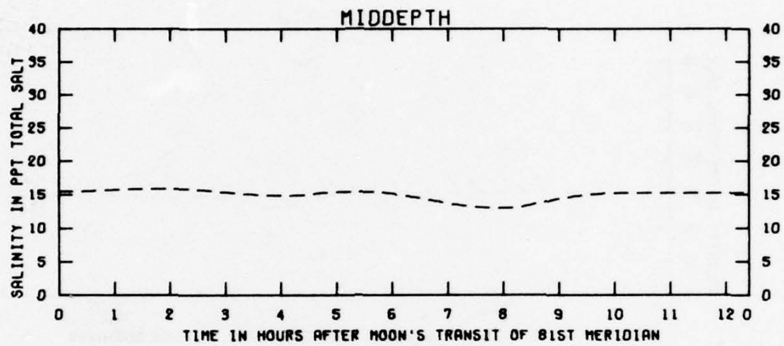
TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND

MODEL — — —

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 10A



TEST CONDITIONS	
TIDE RANGE AT TALBOT ISLAND	4.65 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	2850.0 CFS

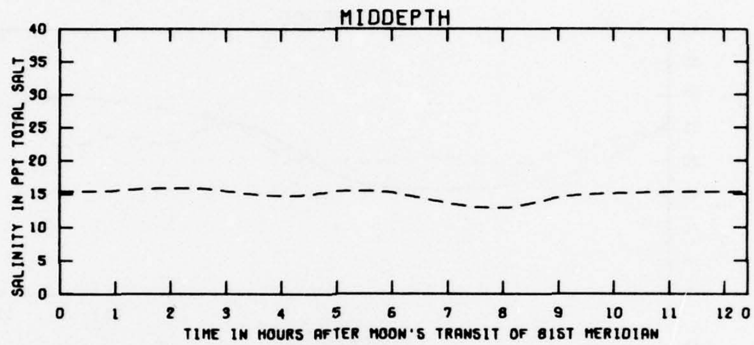
LEGEND

MODEL — — —

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 108

PLATE 132



TEST CONDITIONS

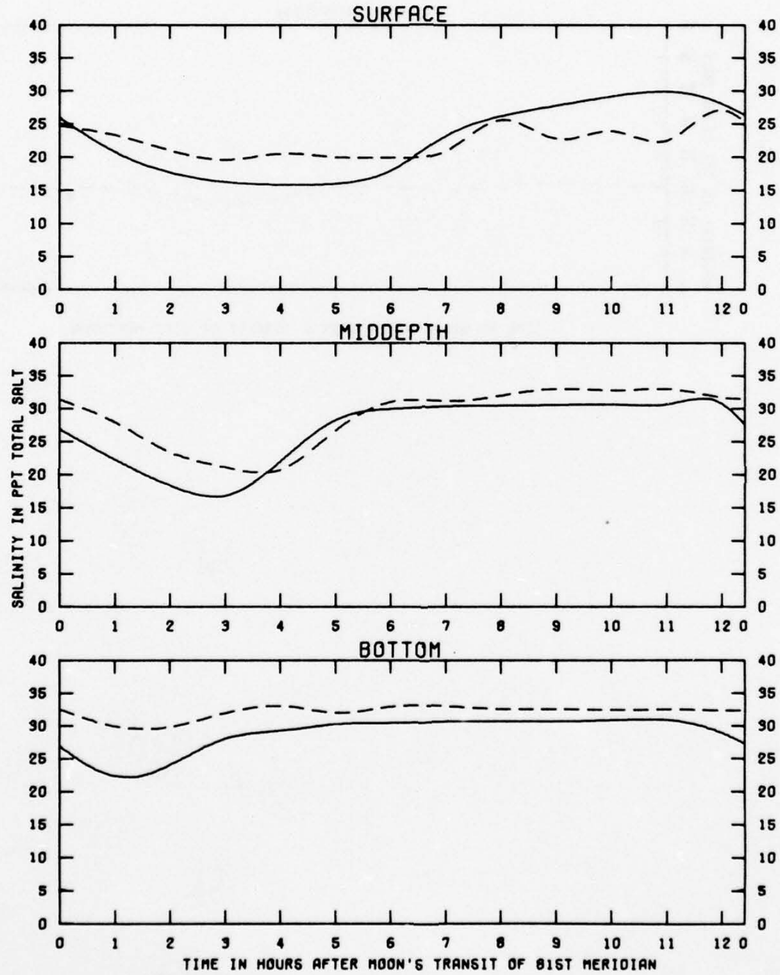
TIDE RANGE AT TALBOT ISLAND	4.65	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	2850.0	CFS

LEGEND

MODEL — — —

VERIFICATION OF SALINITIES FOR 6-13-74 TIDE

STATION 10C



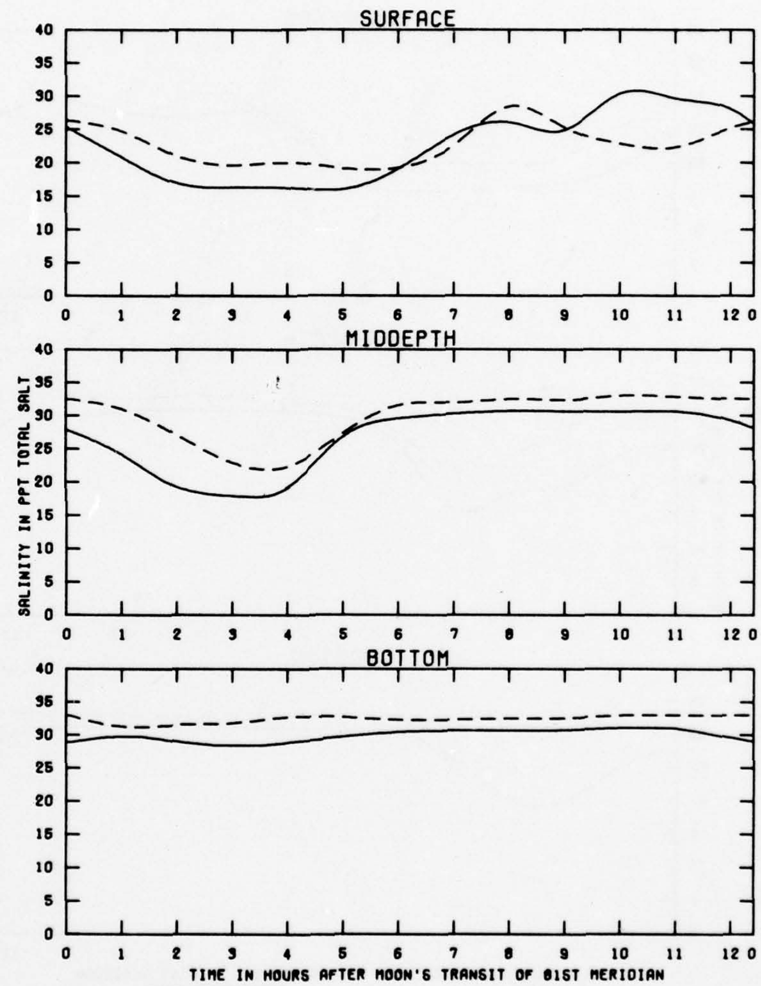
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE

STATION
1A



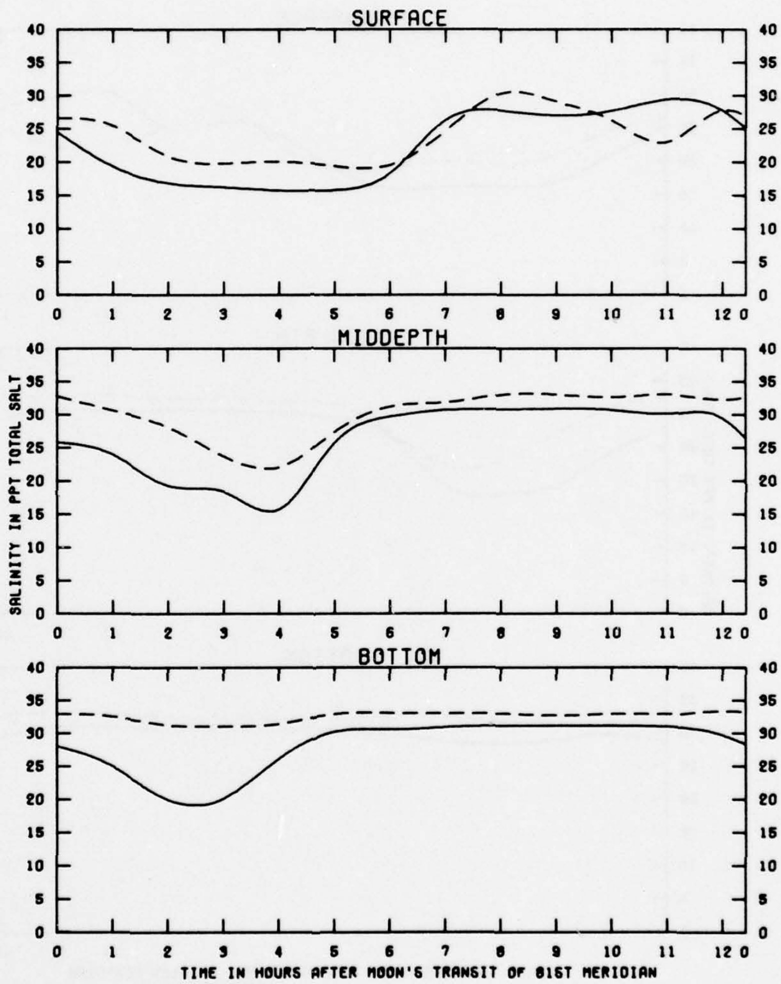
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 18



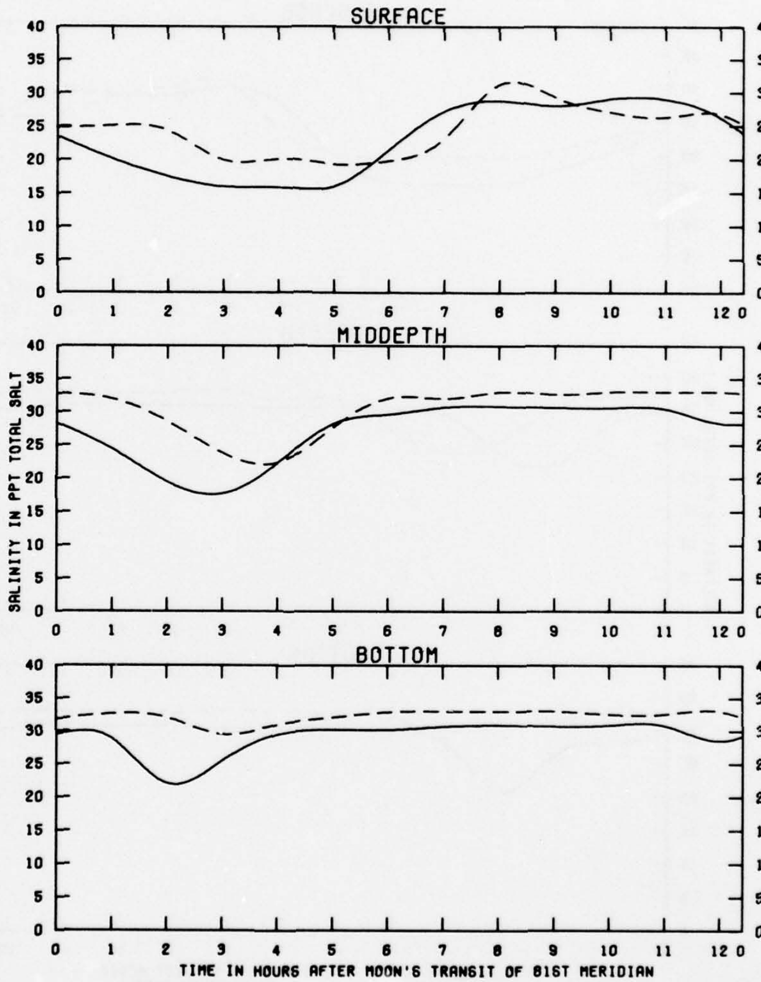
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8240.0	CFS

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 1C

LEGEND
PROTOTYPE ———
MODEL – – –



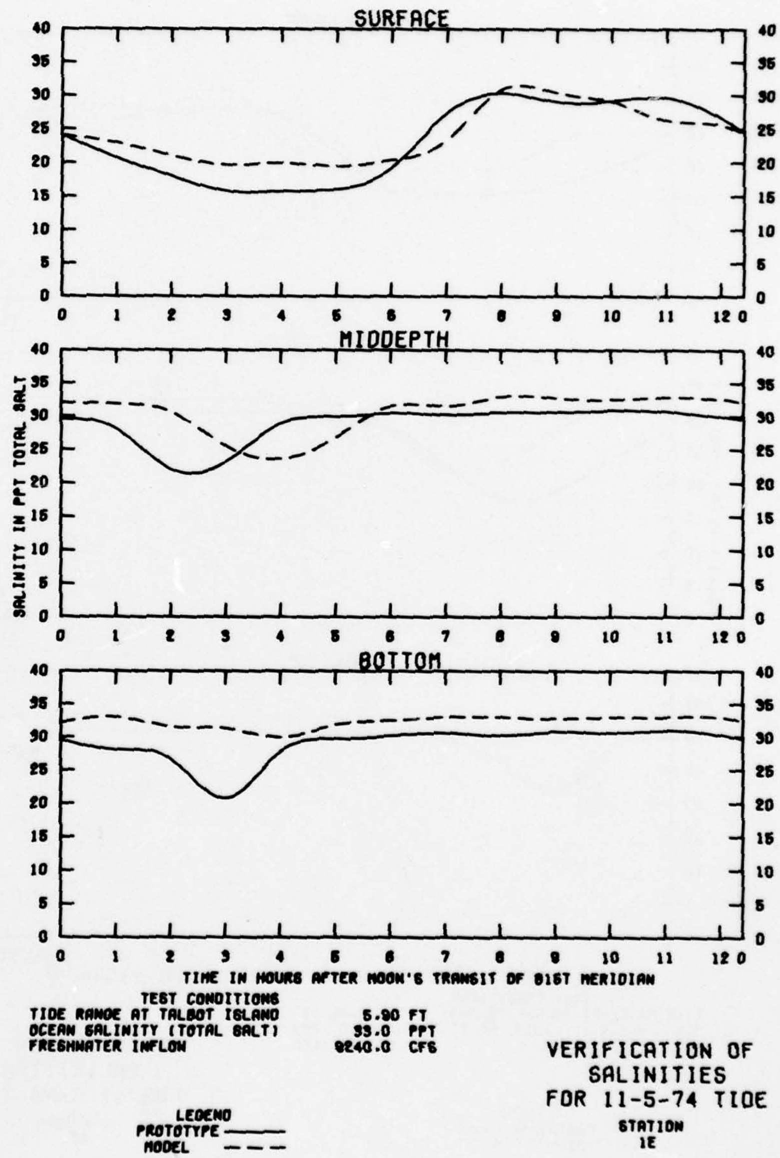
TEST CONDITIONS

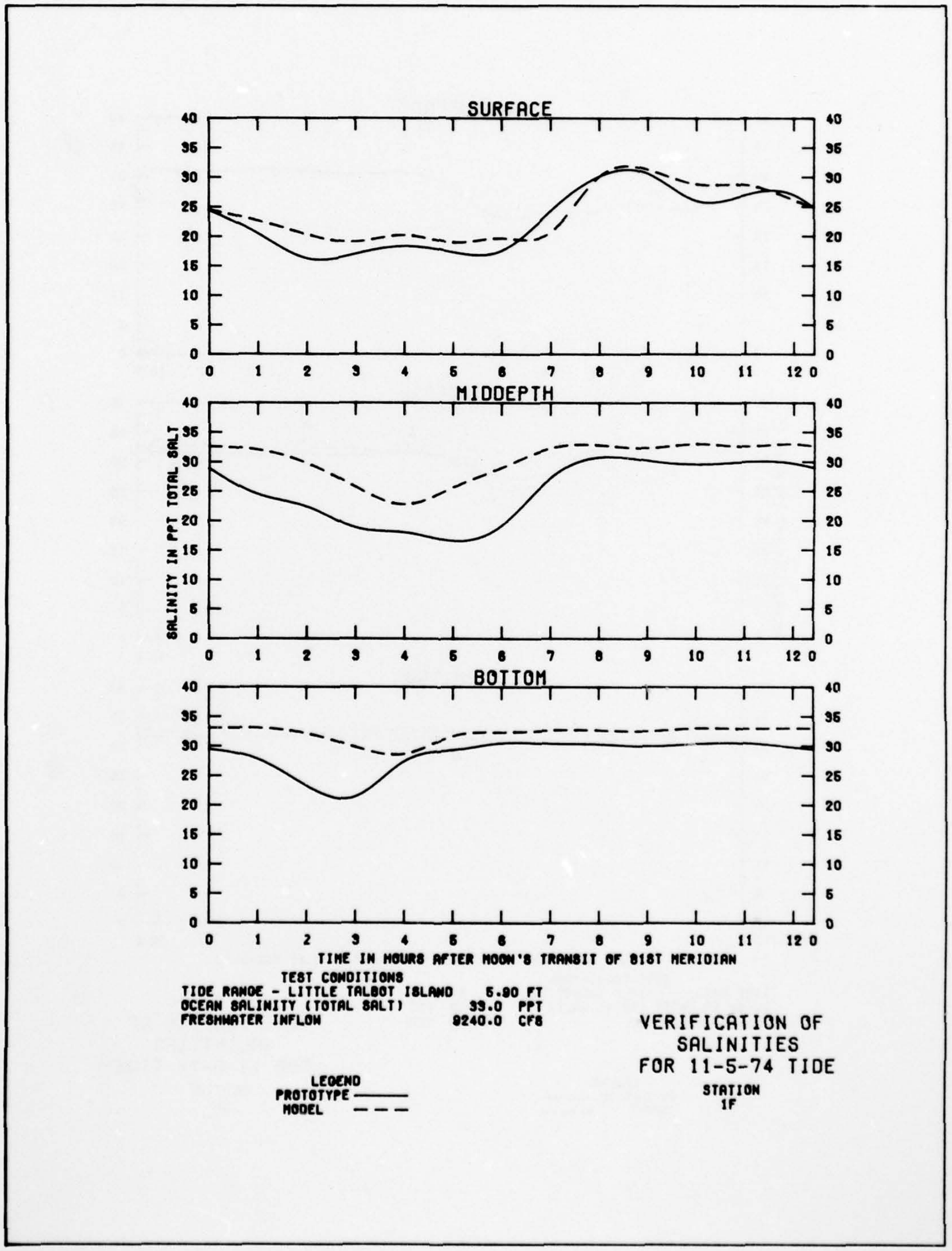
TIDE RANGE AT TALBOT ISLAND	5.90 FT
OCEAN SALINITY (TOTAL SALT)	33.0 PPT
FRESHWATER INFLOW	9240.0 CFS

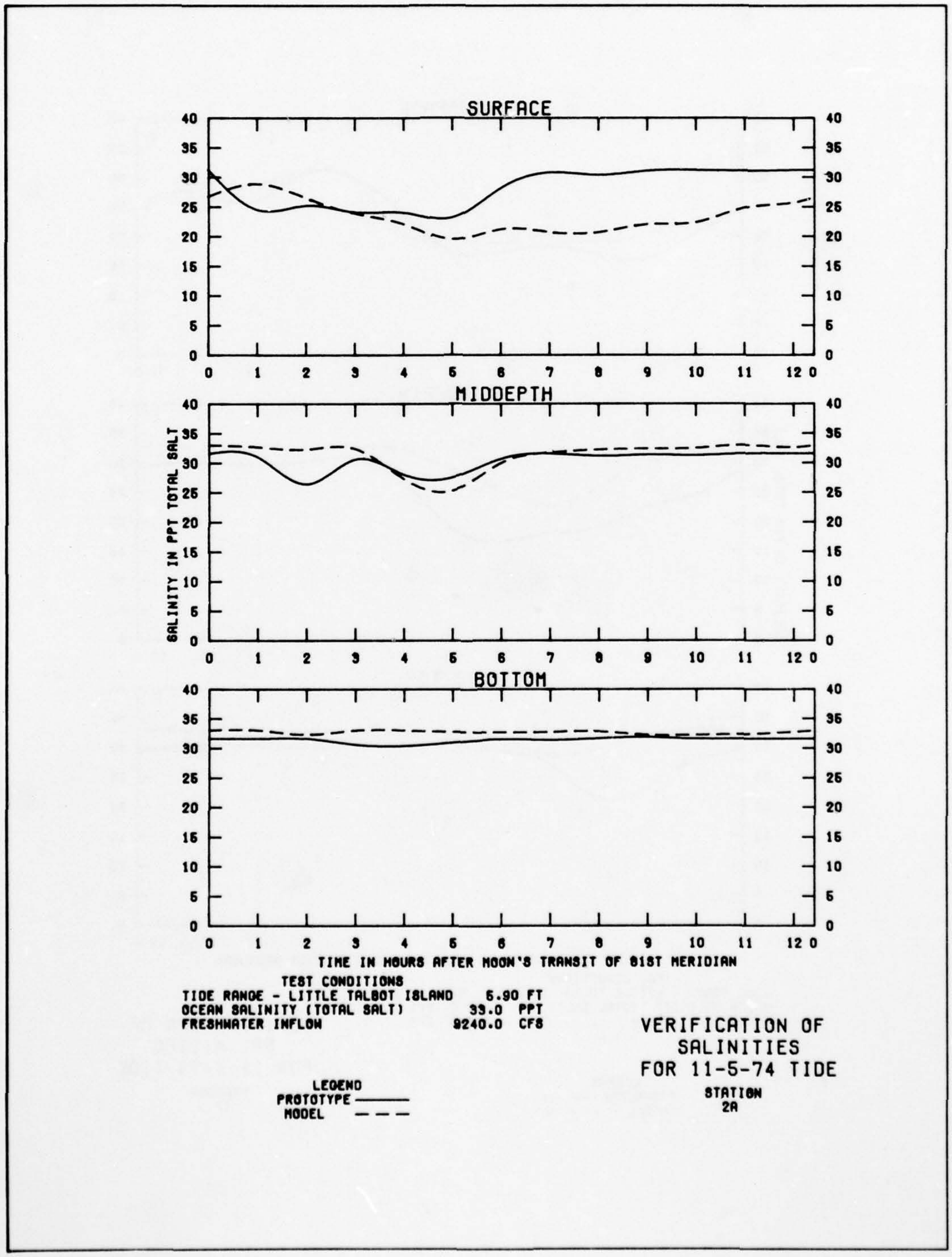
LEGEND
PROTOTYPE ———
MODEL – – –

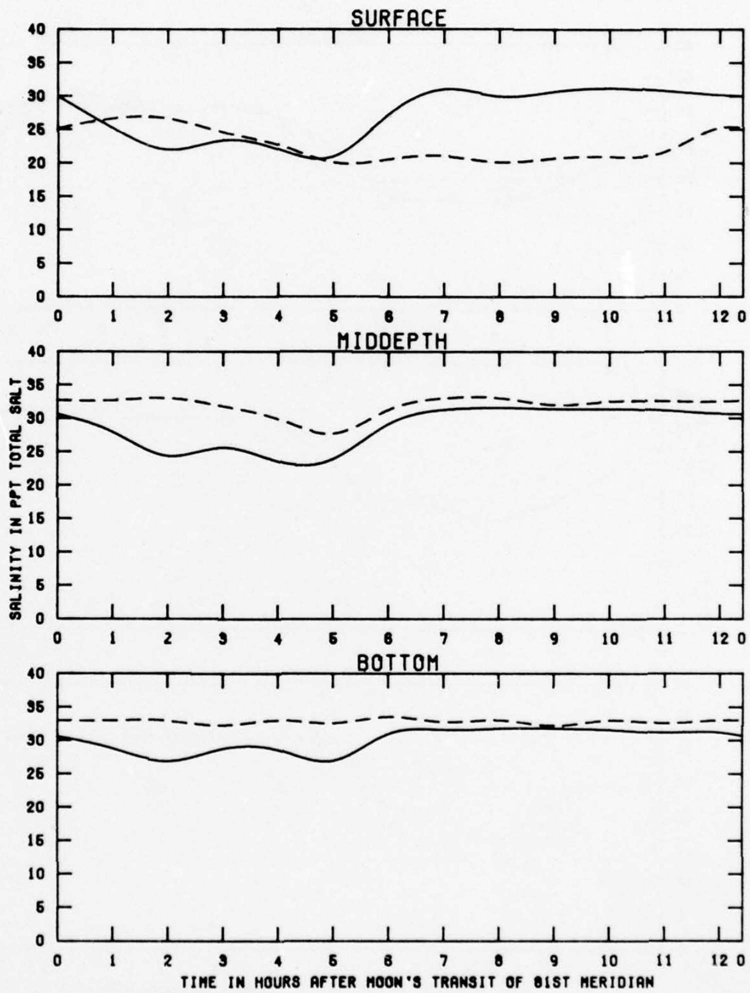
VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE

STATION
10


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE
STATION
1E


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
0
5
10
15
20
25
30
35
40
0
1
2
3
4
5
6
7
8
9
10
11
12
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE
STATION
1F


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS
VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE
STATION
2A
LEGEND
PROTOTYPE
MODEL

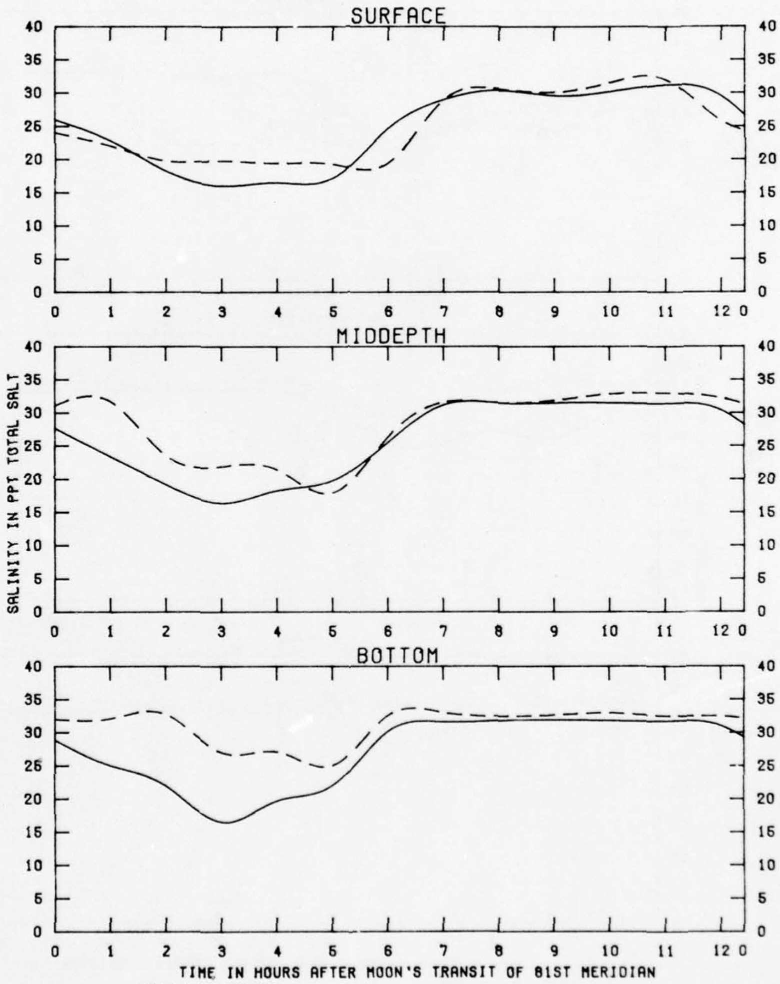


TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 28



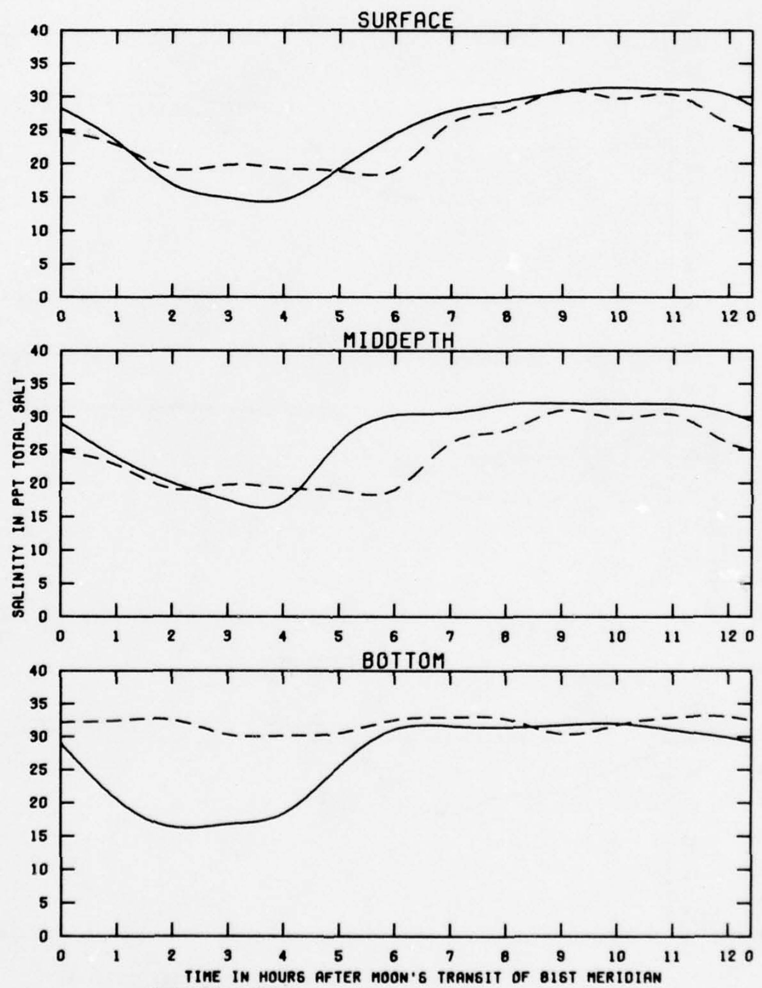
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 6.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE

STATION
2C



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE

STATION
2D

AD-A073 601 ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS F/G 8/8
MAYPORT-MILL COVE MODEL STUDY. REPORT 1. HYDRAULIC, SALINITY, A--ETC(U)
JUL 79 N J BROGDON
UNCLASSIFIED WES-TR-HL-79-12 NL

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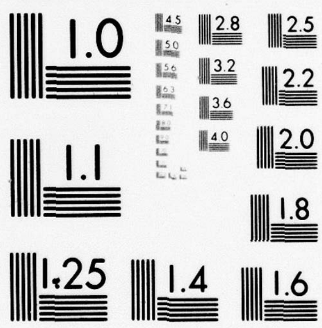
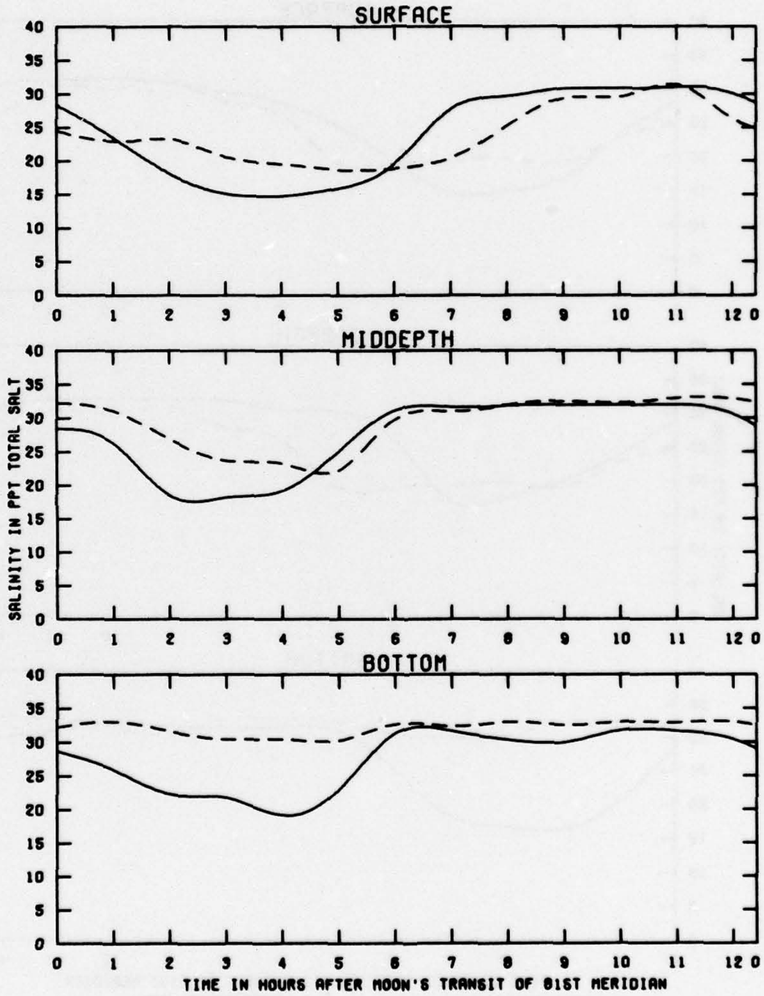


MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU



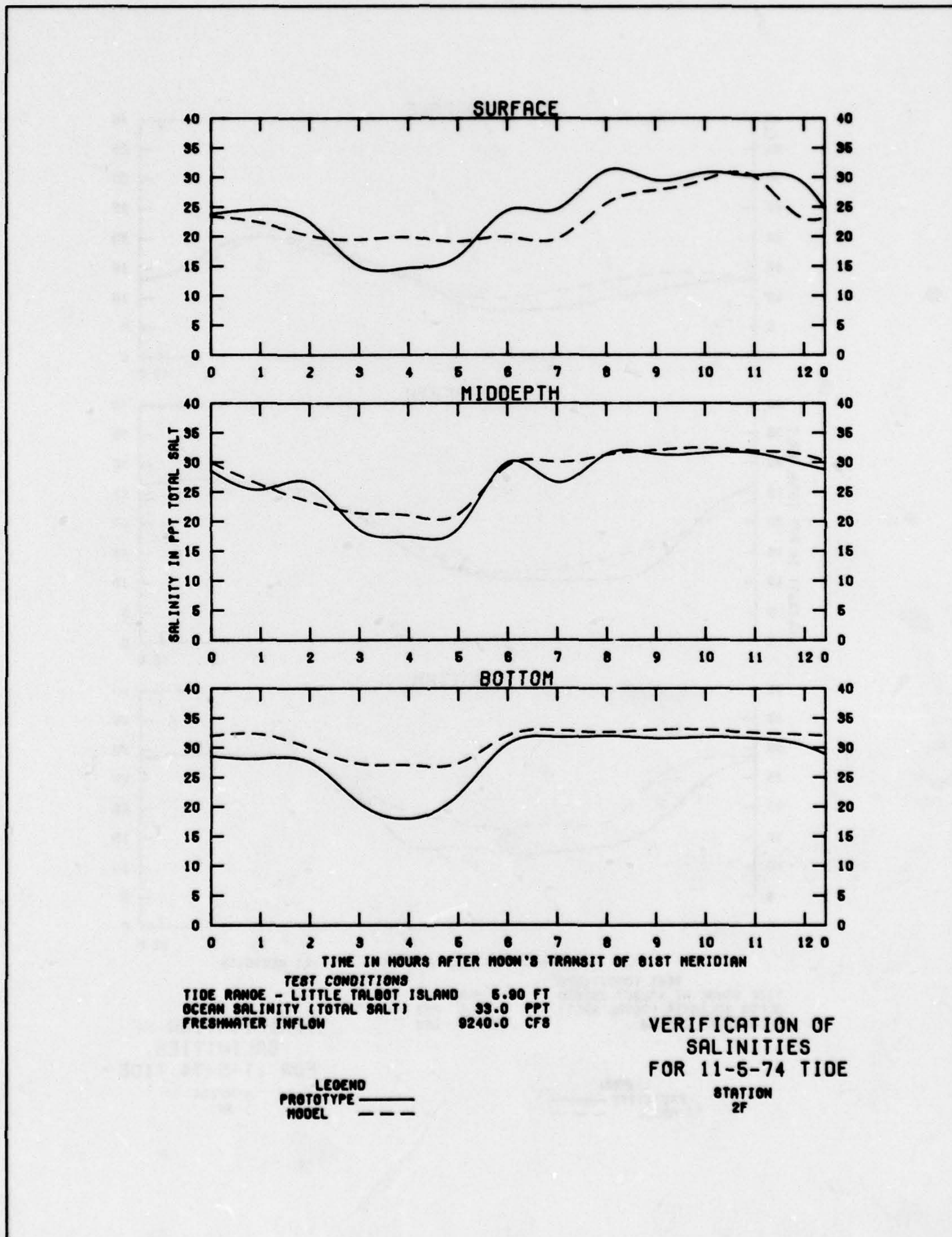
TEST CONDITIONS

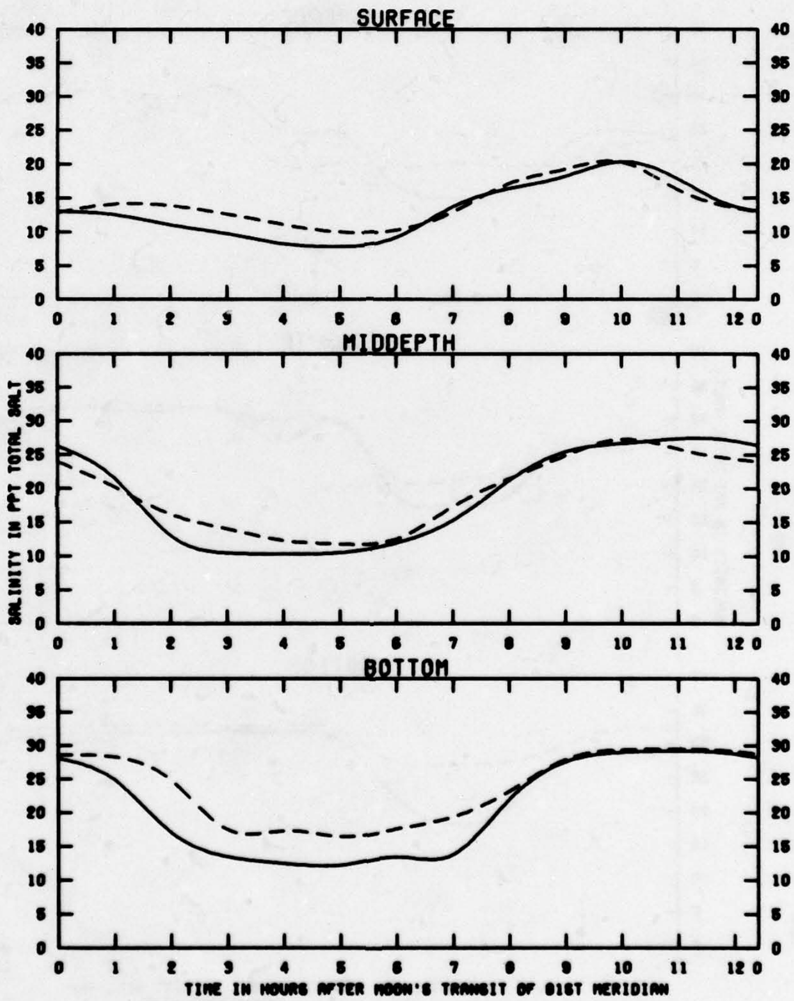
TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 2E


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
0
5
10
15
20
25
30
35
40
1
2
3
4
6
7
8
9
11
12
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE
STATION
2F



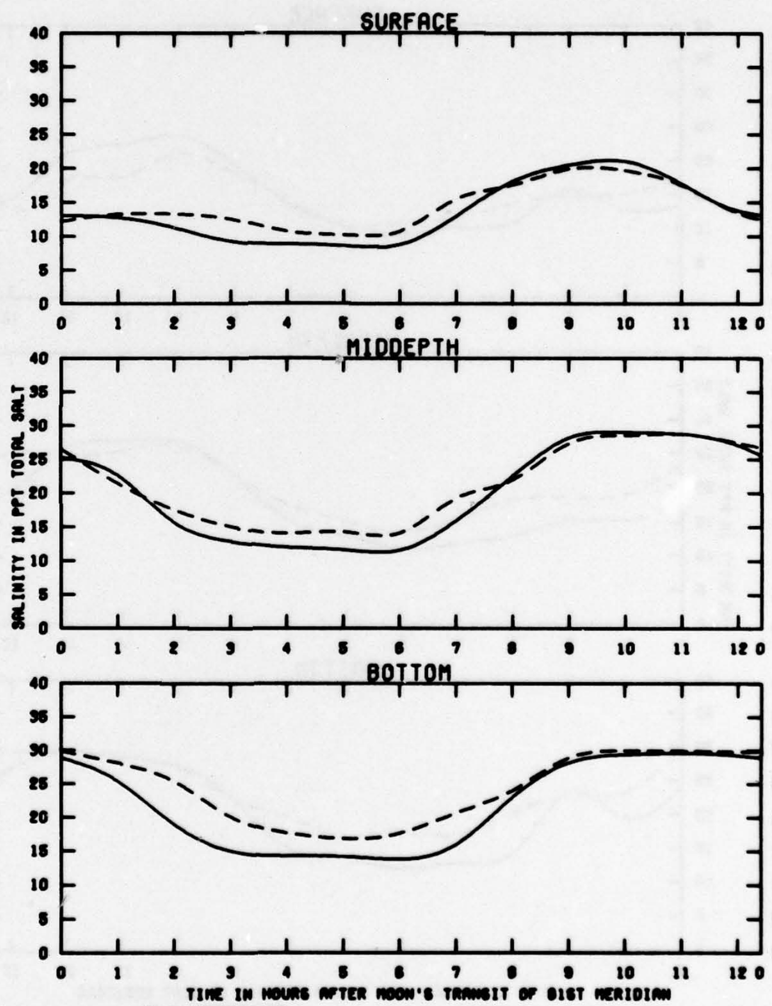
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE

STATION
3A



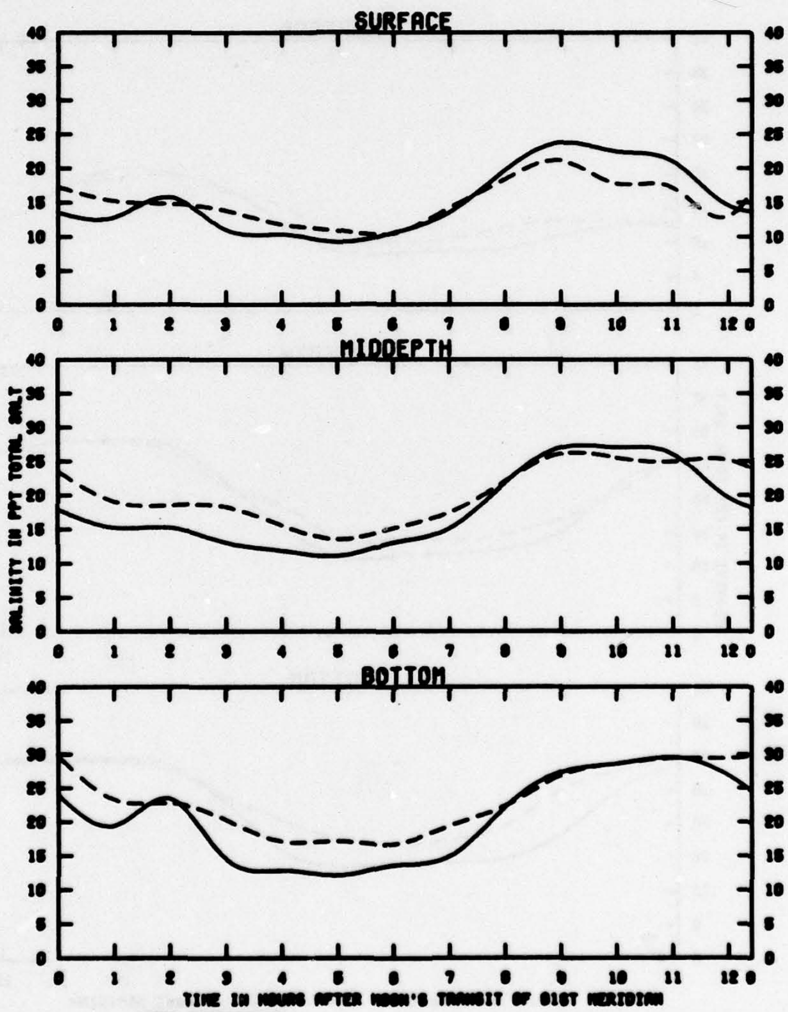
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.90	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

STATION
38

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE



TEST CONDITIONS

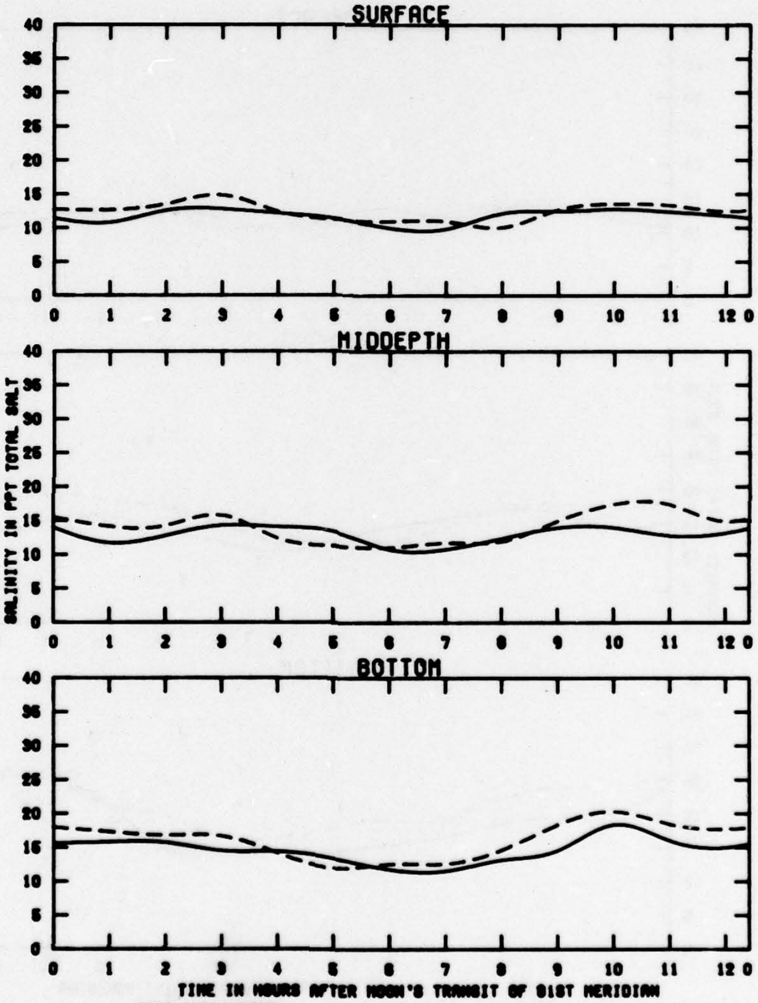
TIDE RANGE AT TALBOT ISLAND	5.80	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	9240.0	CFS

LEGEND
PROTOTYPE ————
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-5-74 TIDE

STATION
SC

PLATE 148

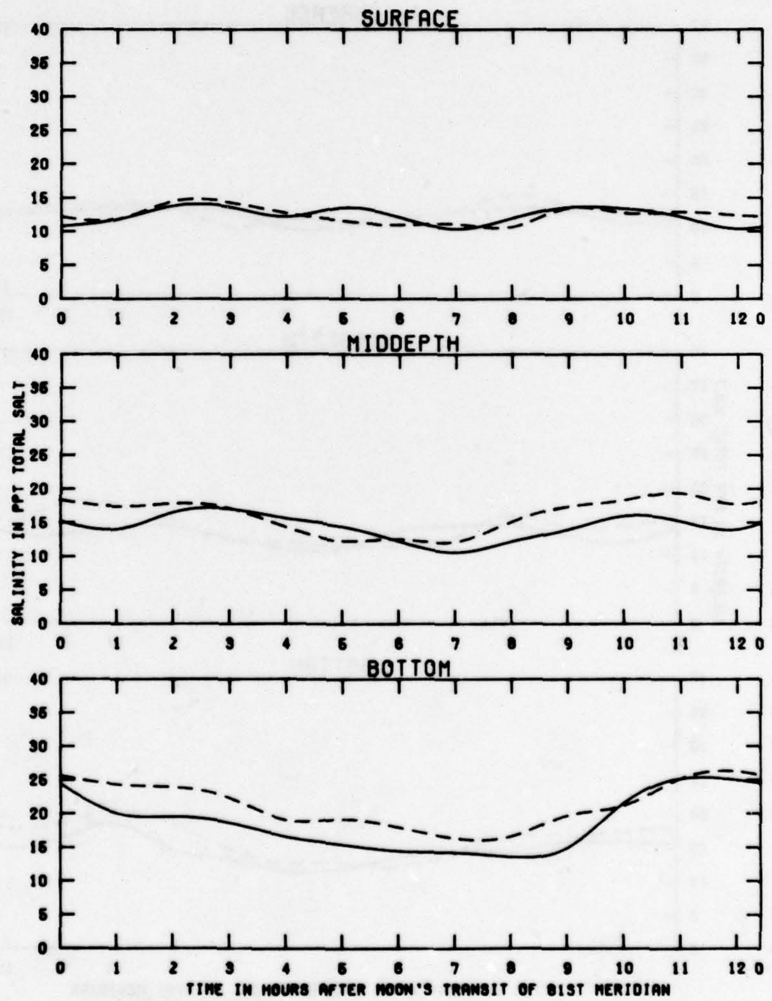


TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 39.0 PPT
FRESHWATER INFLOW 8240.0 CFS

LEGEND
PROTOTYPE ——
MODEL — — —

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 4A



TEST CONDITIONS

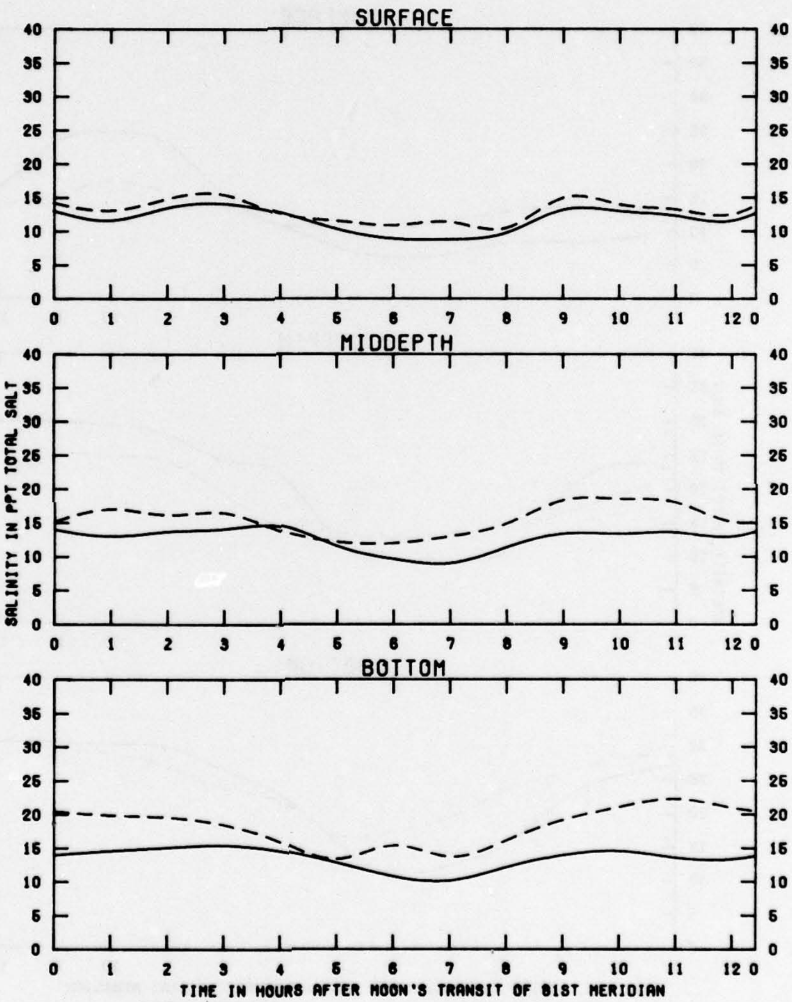
TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS

LEGEND
PROTOTYPE ———
MODEL - - -

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 4B

PLATE 150



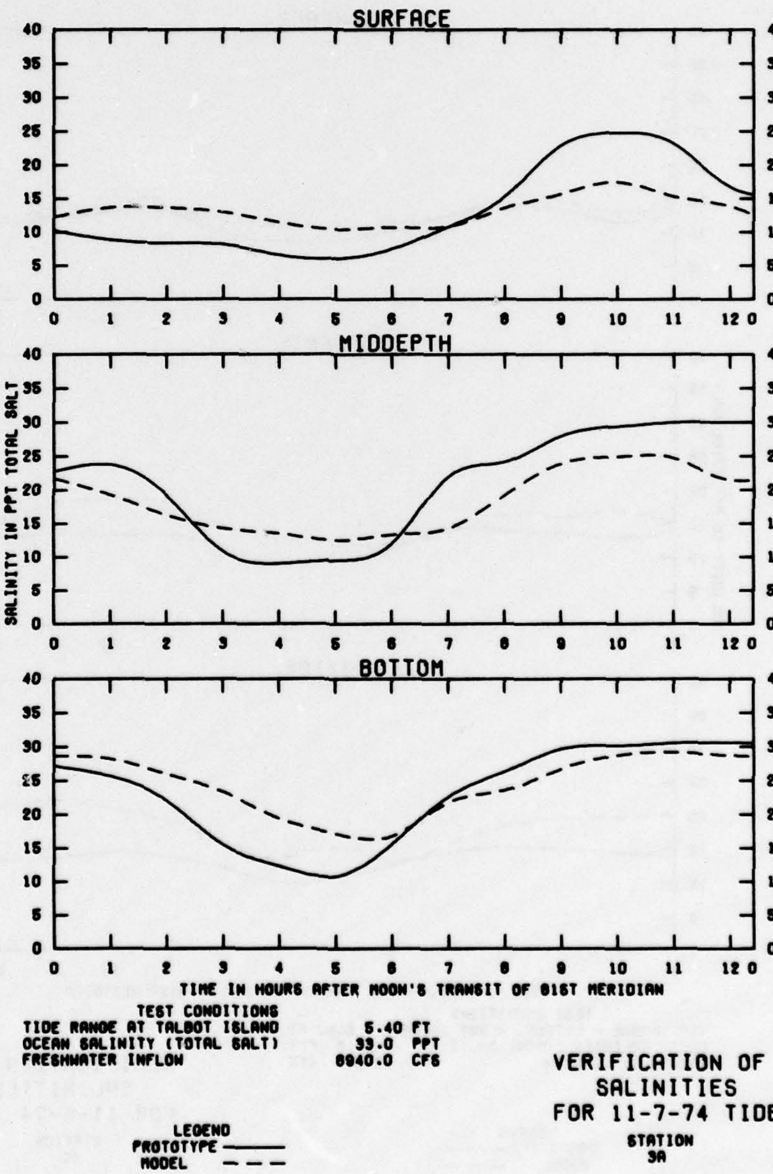
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.90 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 9240.0 CFS

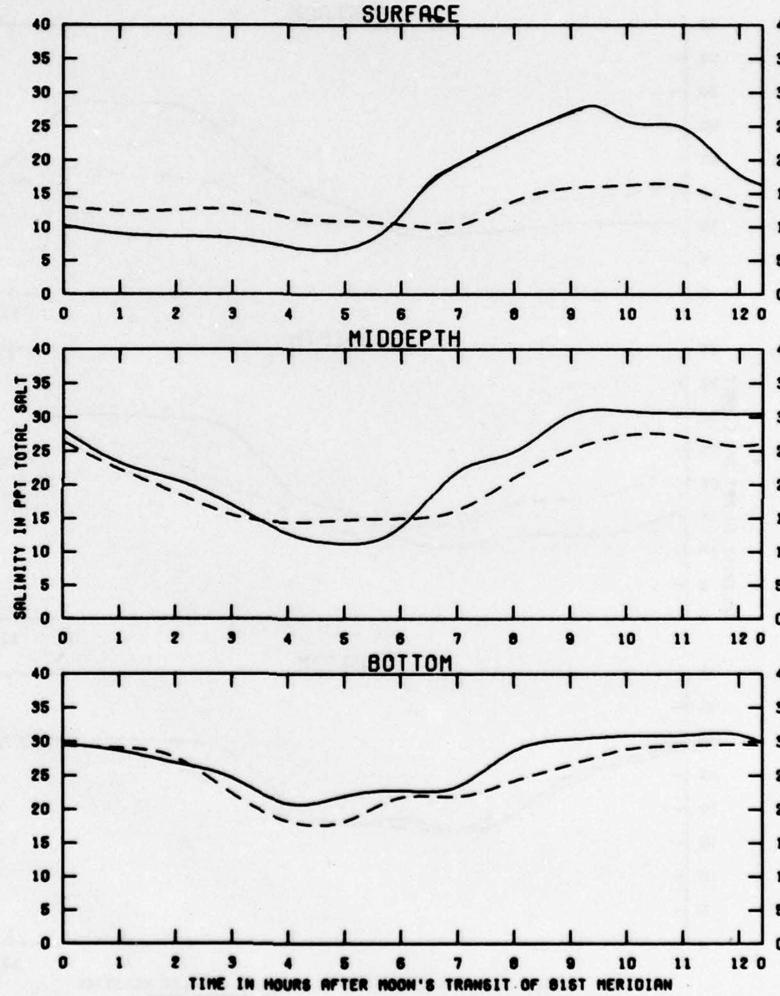
LEGEND
PROTOTYPE ———
MODEL – – – –

VERIFICATION OF SALINITIES FOR 11-5-74 TIDE

STATION 4C



VERIFICATION OF SALINITIES FOR 11-7-74 TIDE



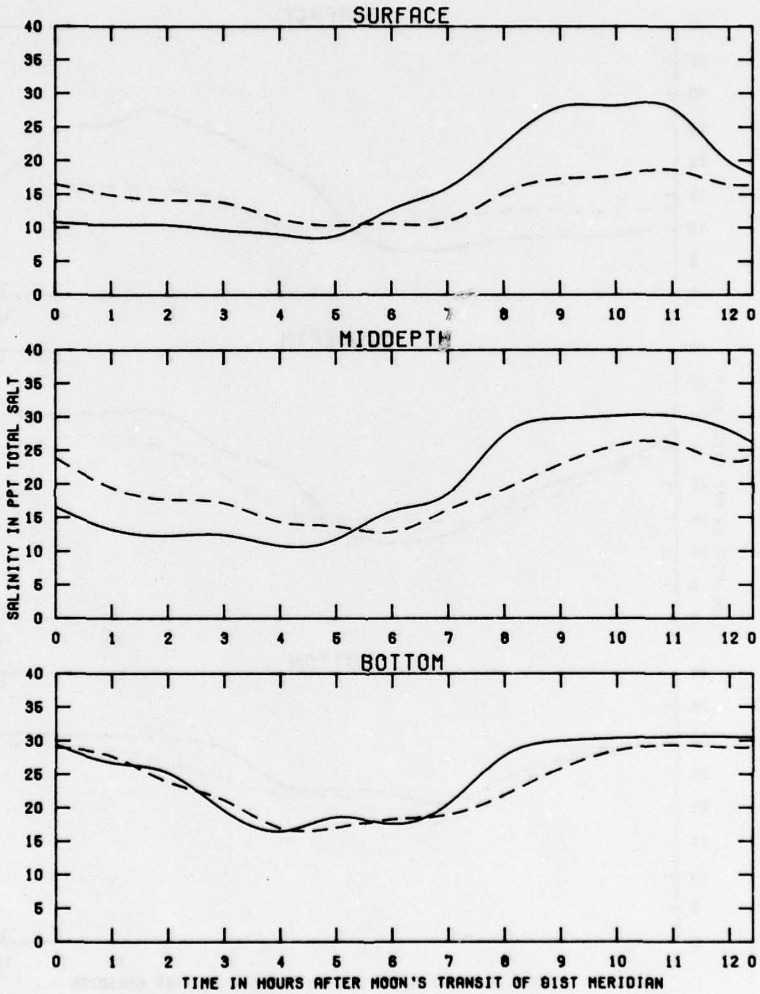
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 3B



TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT

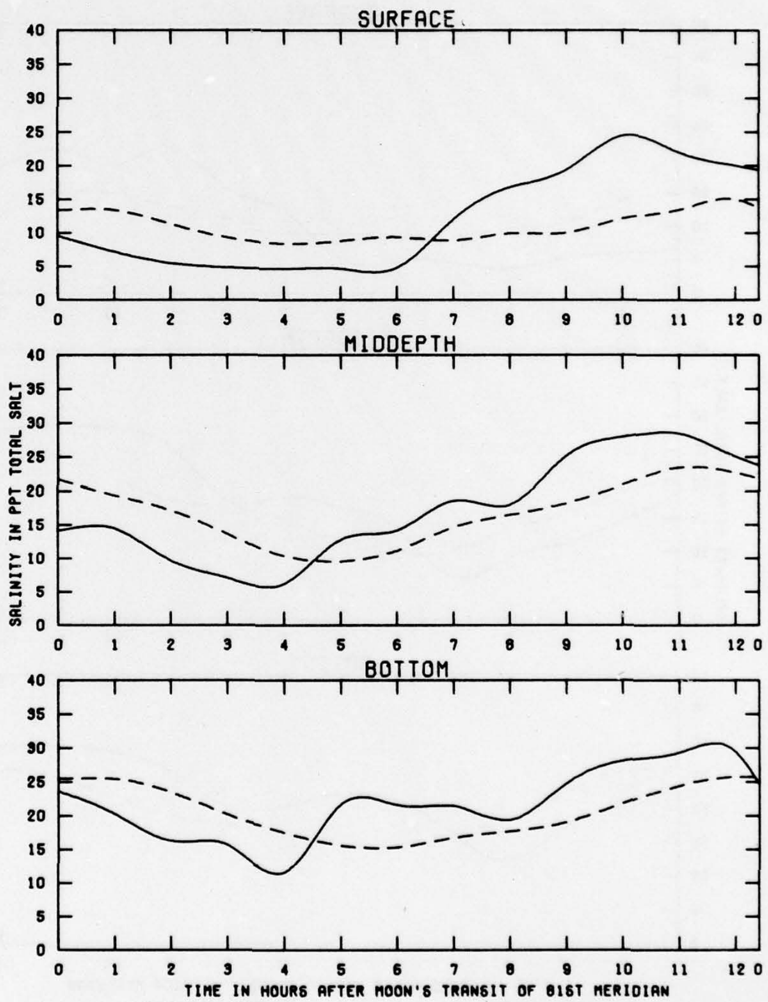
OCEAN SALINITY (TOTAL SALT) 33.0 PPT

FRESHWATER INFLOW 6940.0 CFS

VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE

LEGEND
PROTOTYPE ———
MODEL - - -

STATION
3C



TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 5A

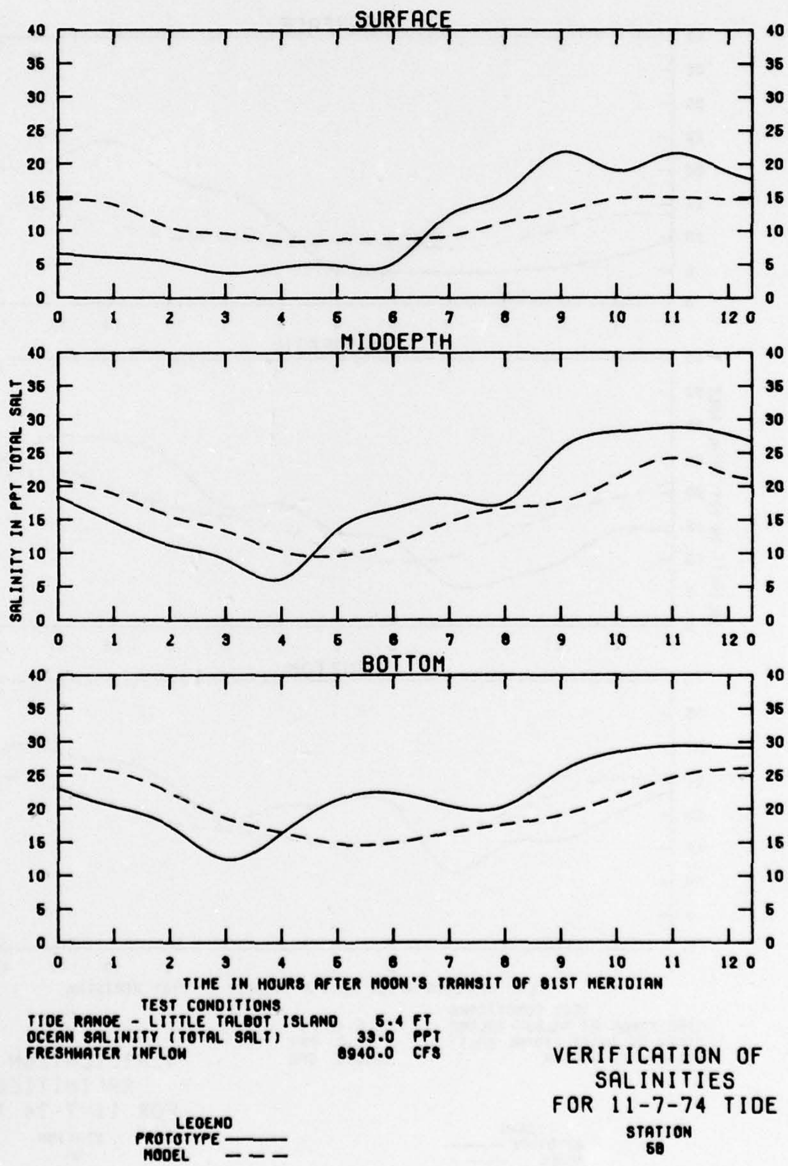
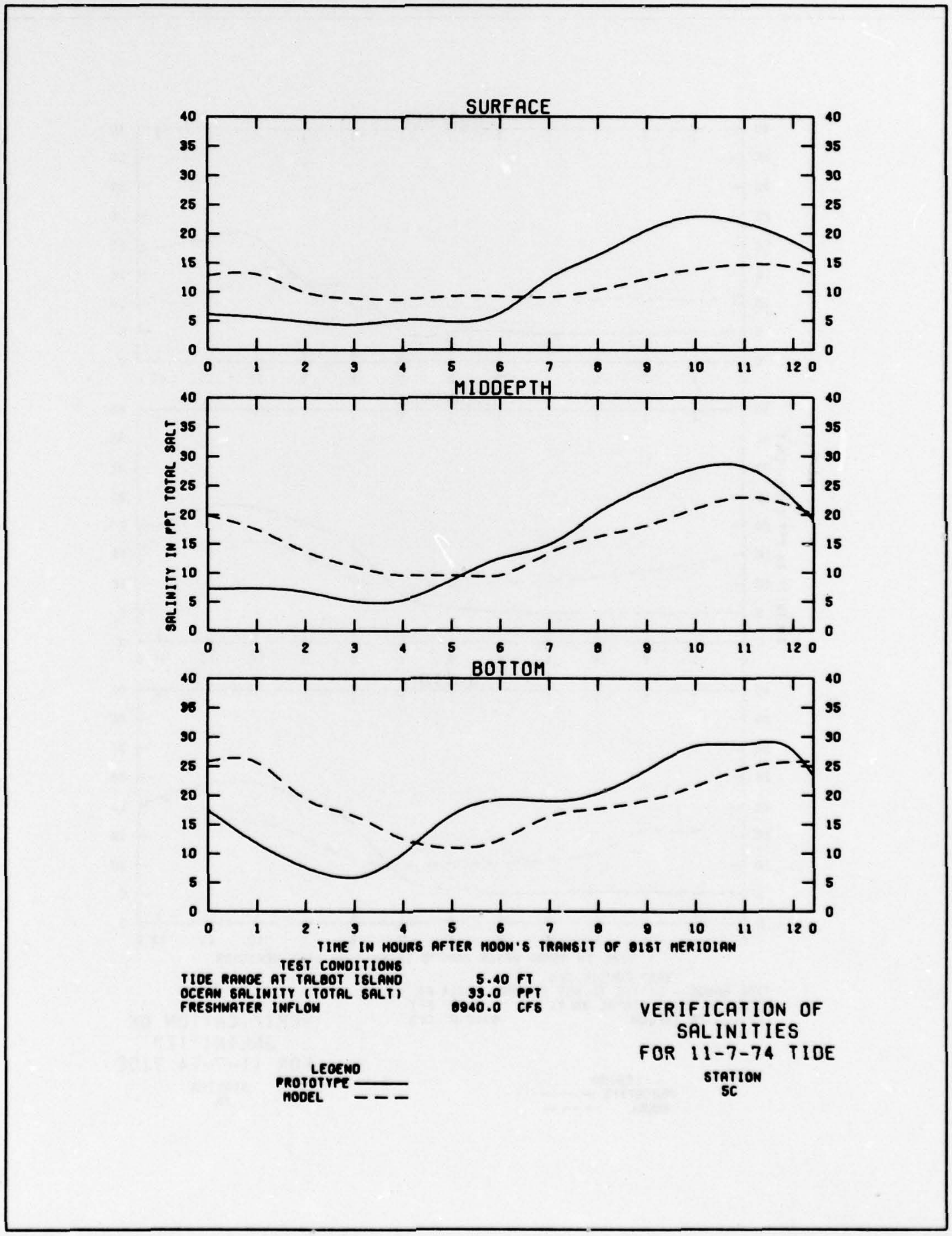
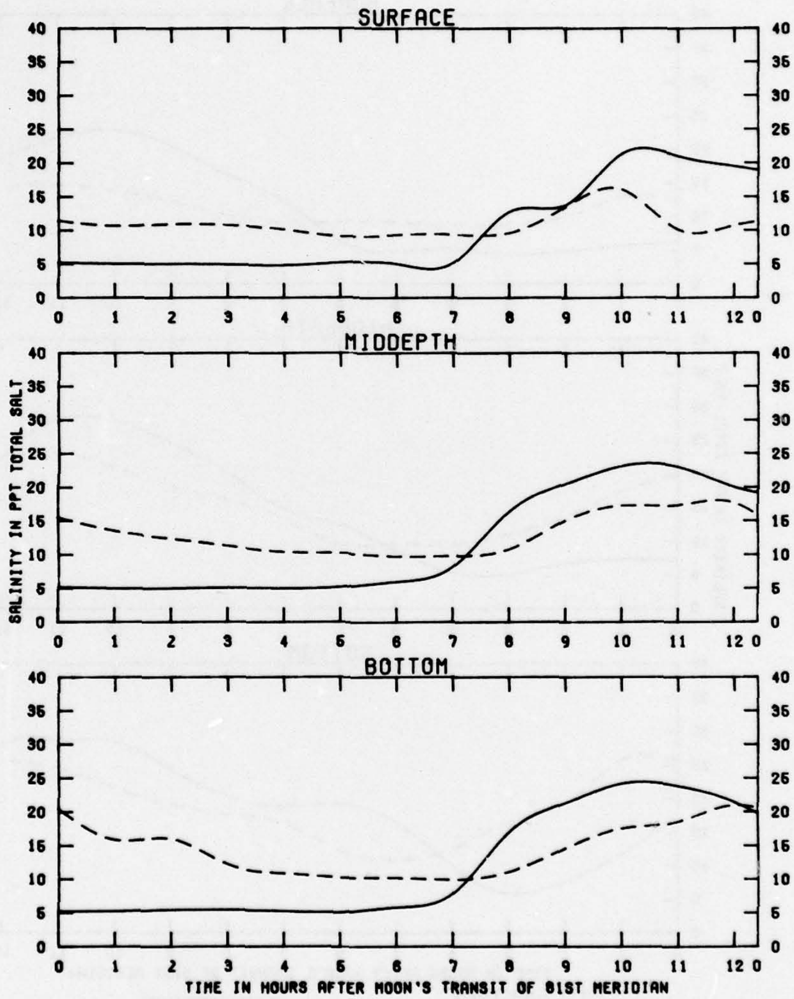

SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE
LEGEND
PROTOTYPE
MODEL
STATION
58

PLATE 156


SURFACE
MIDDEPTH
BOTTOM
SALINITY IN PPT TOTAL SALT
0 5 10 15 20 25 30 35 40
0 1 2 3 4 5 6 7 8 9 10 11 12 0
TIME IN HOURS AFTER MOON'S TRANSIT OF 81ST MERIDIAN
TEST CONDITIONS
TIDE RANGE AT TALBOT ISLAND 5.40 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS
LEGEND
PROTOTYPE
MODEL
VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE
STATION
5C



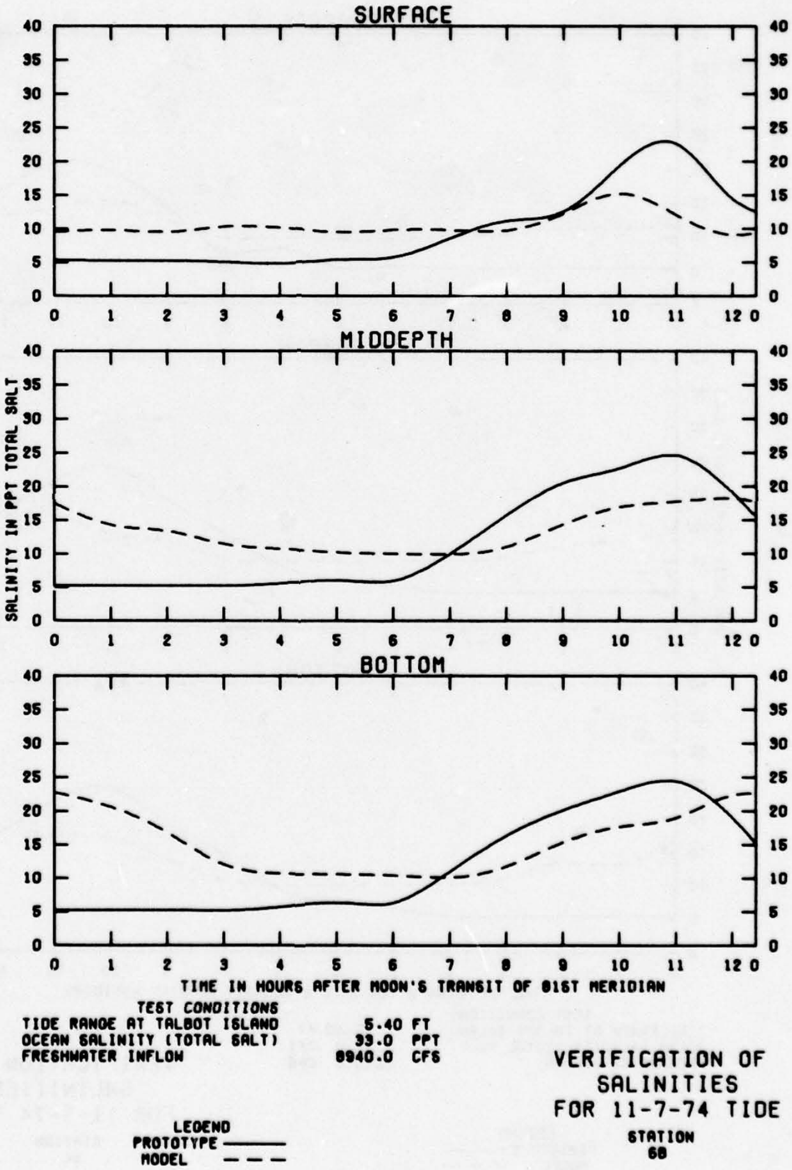
TEST CONDITIONS

TIDE RANGE - LITTLE TALBOT ISLAND 5.4 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

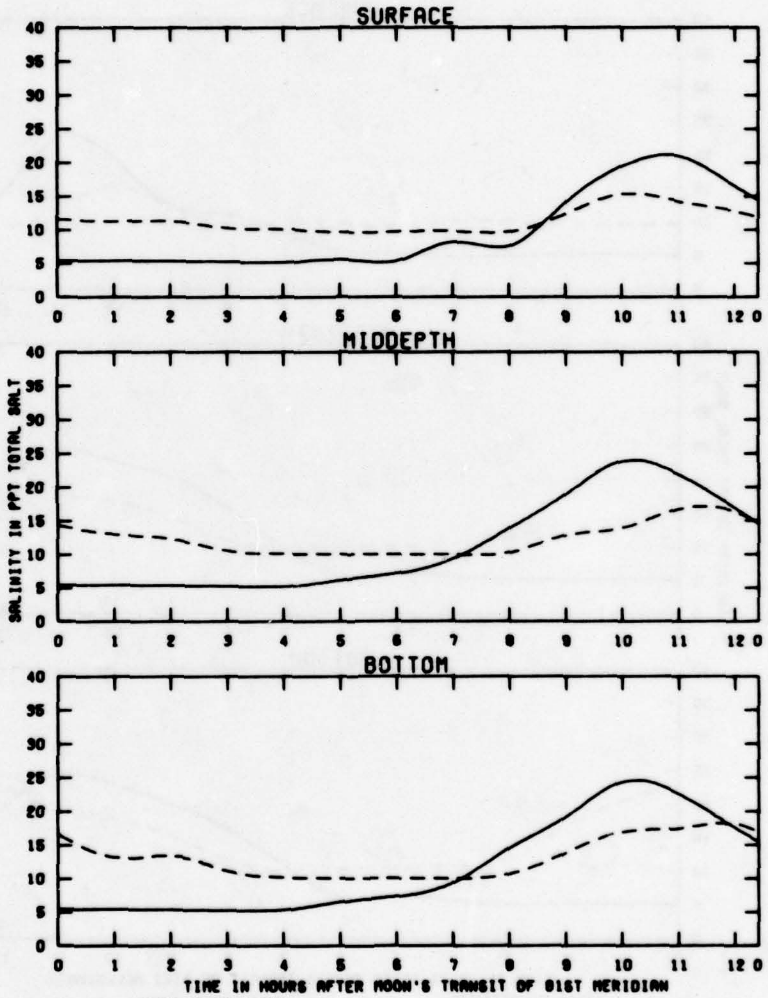
LEGEND
PROTOTYPE ———
MODEL – – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 6A



VERIFICATION OF SALINITIES FOR 11-7-74 TIDE



TEST CONDITIONS

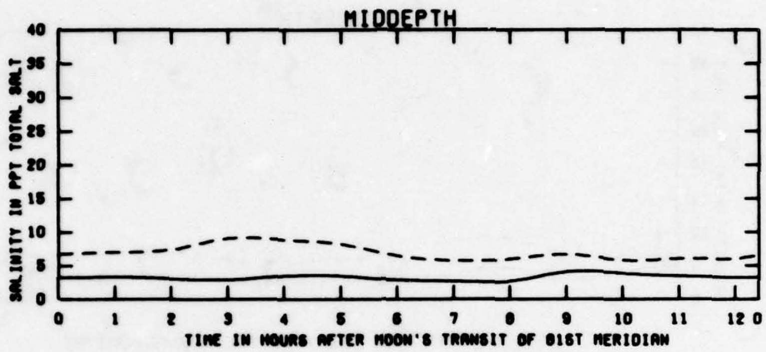
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION
6C

PLATE 160



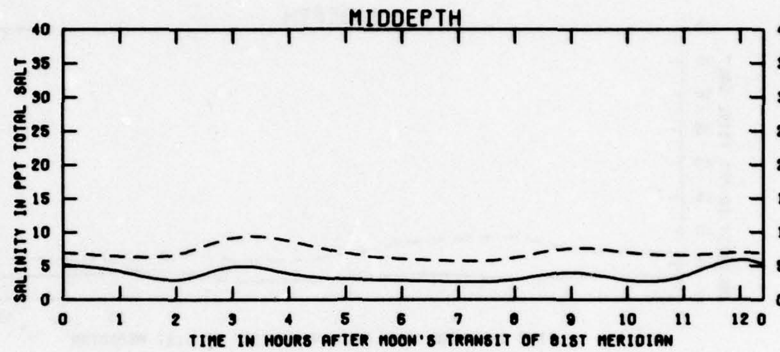
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE

STATION
7A



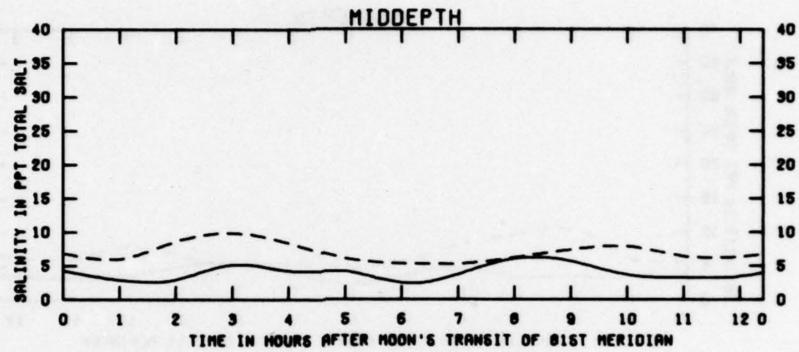
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION
7B

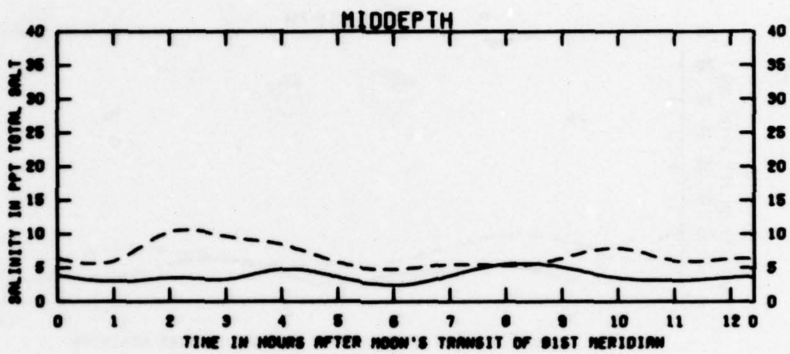


TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION
7C



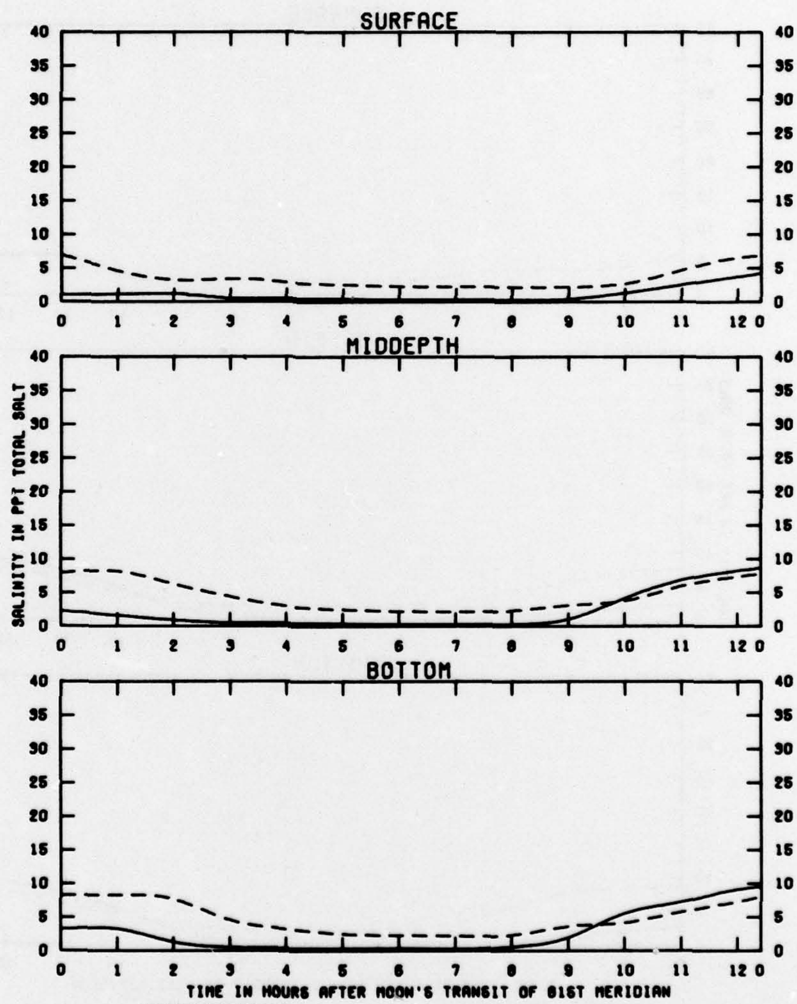
TEST CONDITIONS		
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8840.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE

STATION
7D

PLATE 164



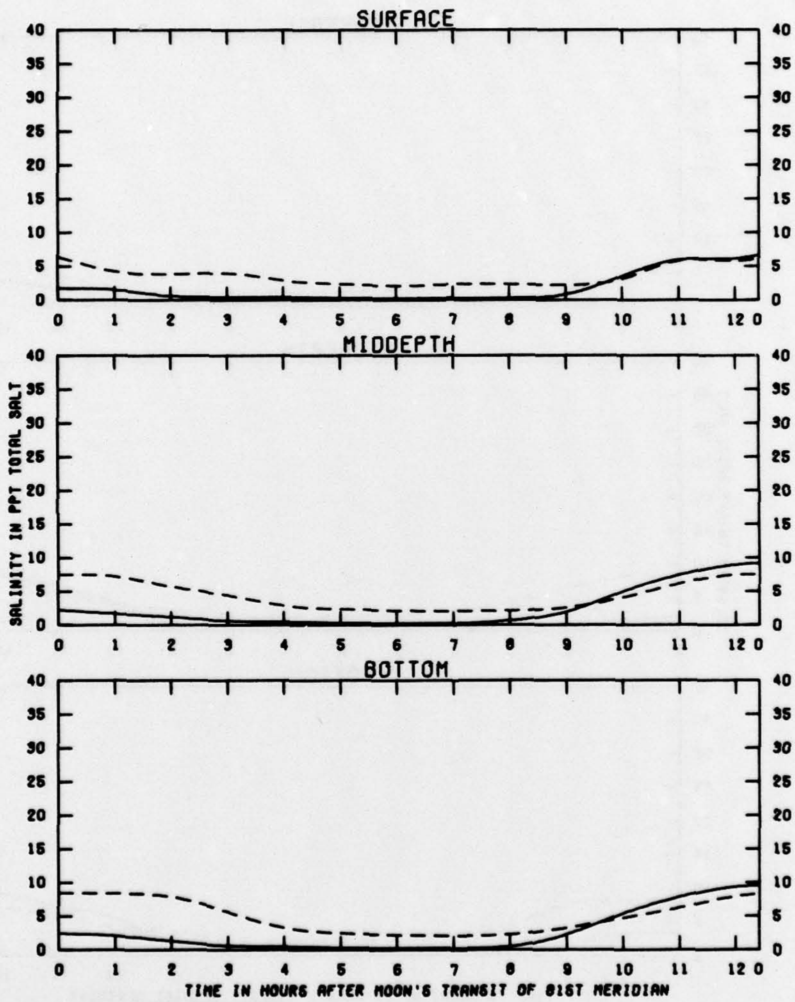
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE

STATION
8A



TEST CONDITIONS

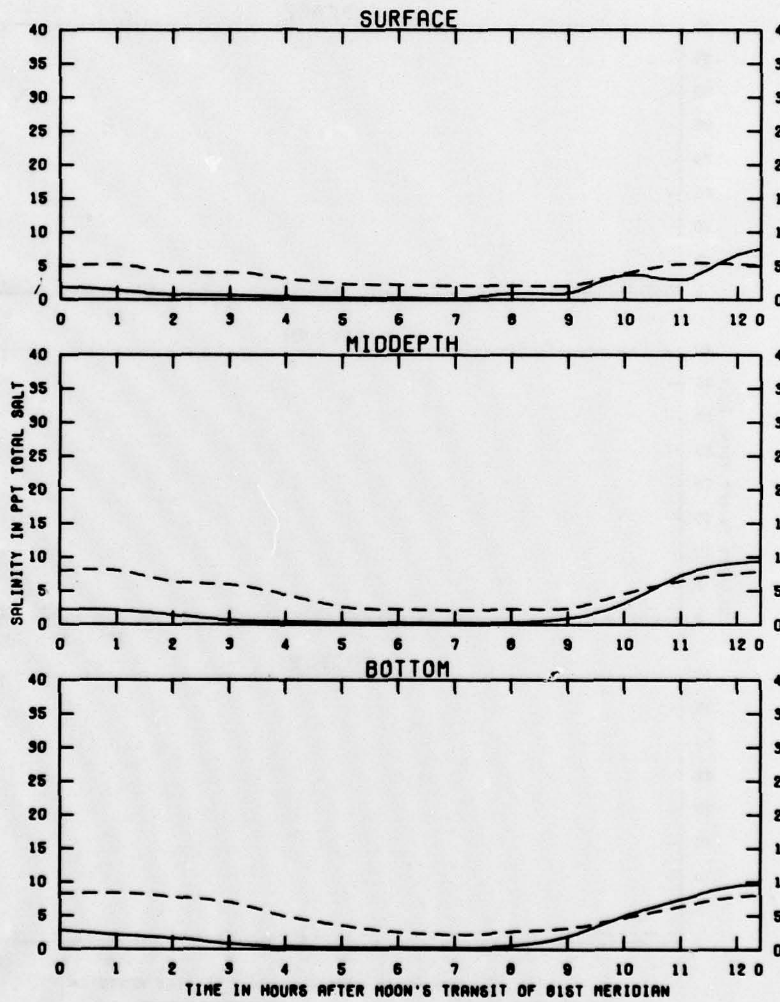
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 8B

PLATE 166



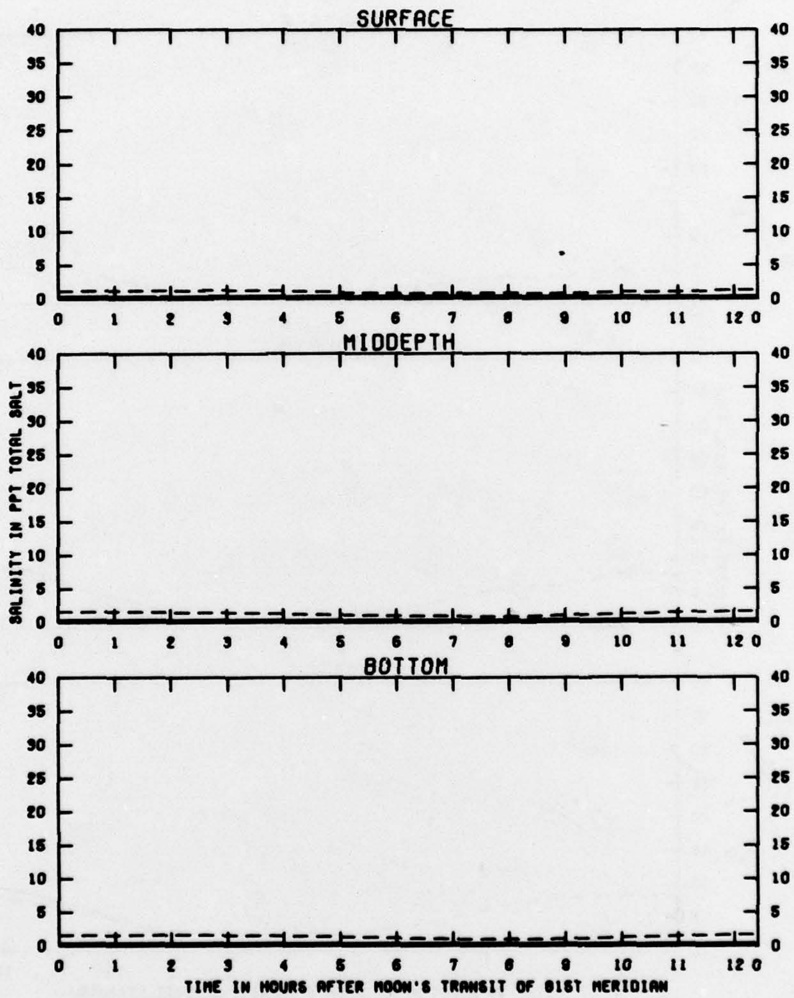
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND 5.40 FT
OCEAN SALINITY (TOTAL SALT) 33.0 PPT
FRESHWATER INFLOW 8940.0 CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION
8C



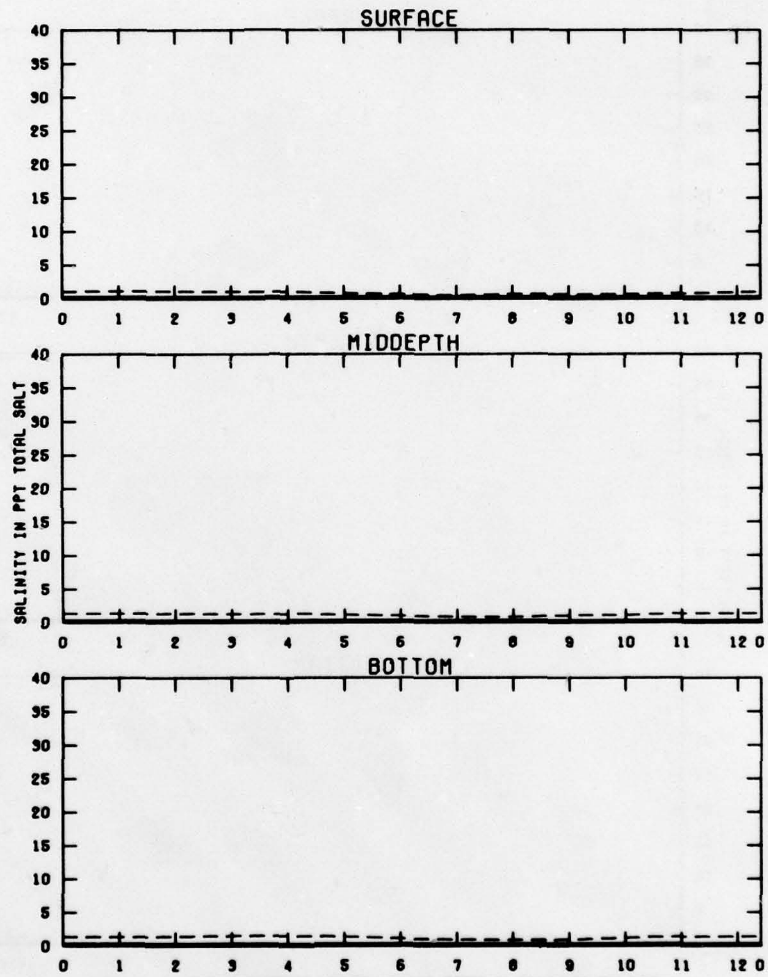
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

LEGEND
PROTOTYPE ————
MODEL — — —

STATION
9A



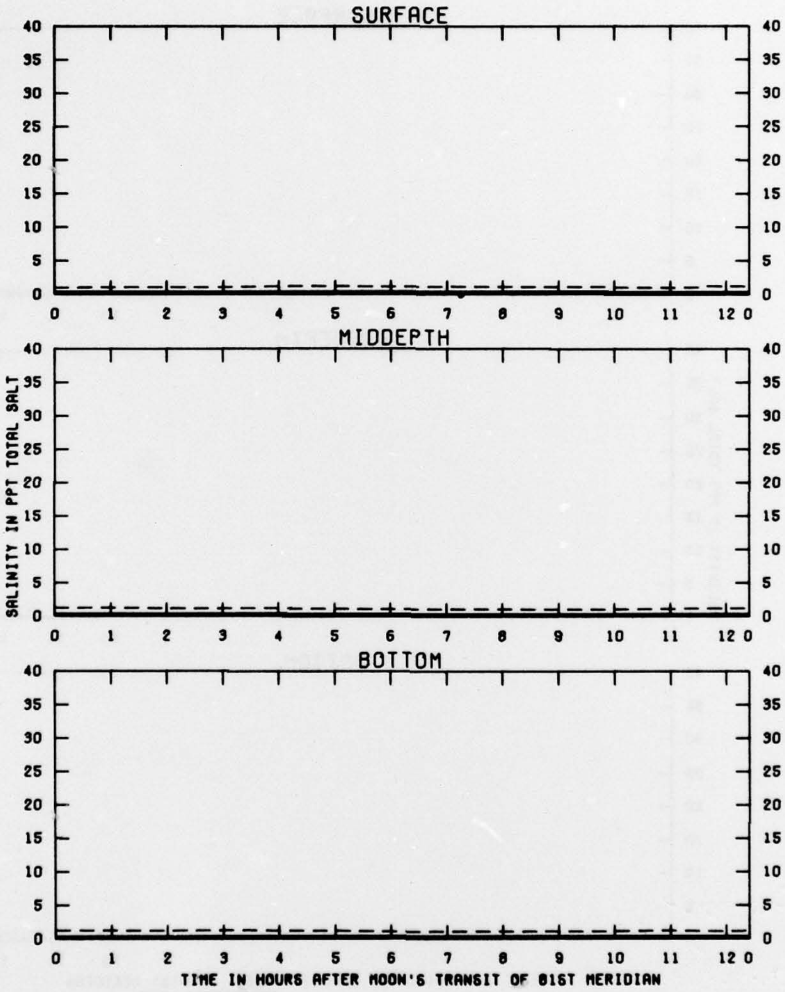
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 9B

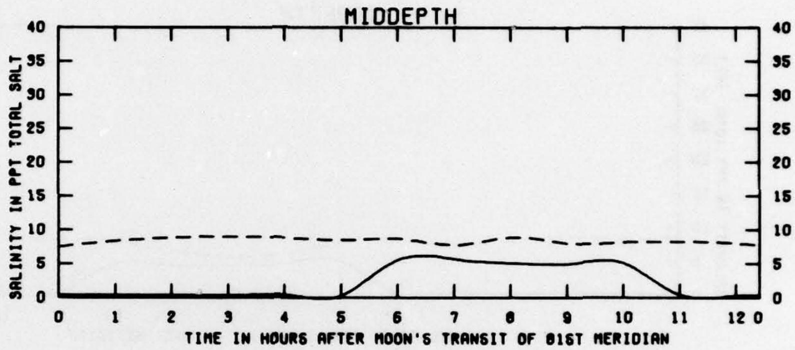


TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 9C



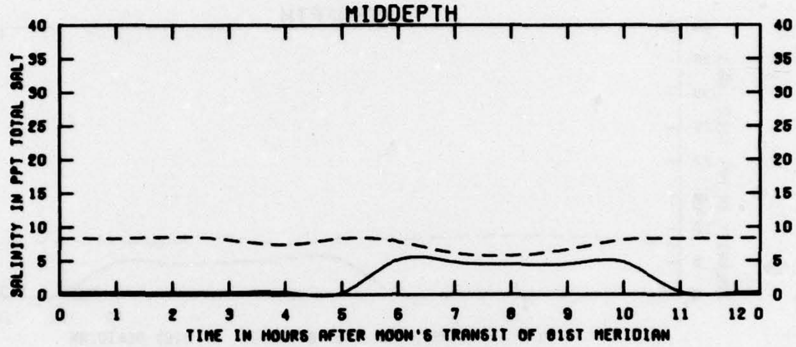
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

LEGEND
PROTOTYPE ———
MODEL — — —

STATION
10A



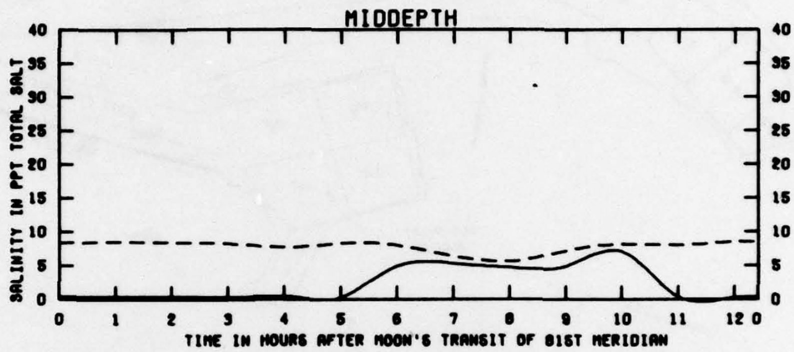
TEST CONDITIONS

TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL – – –

VERIFICATION OF SALINITIES FOR 11-7-74 TIDE

STATION 108



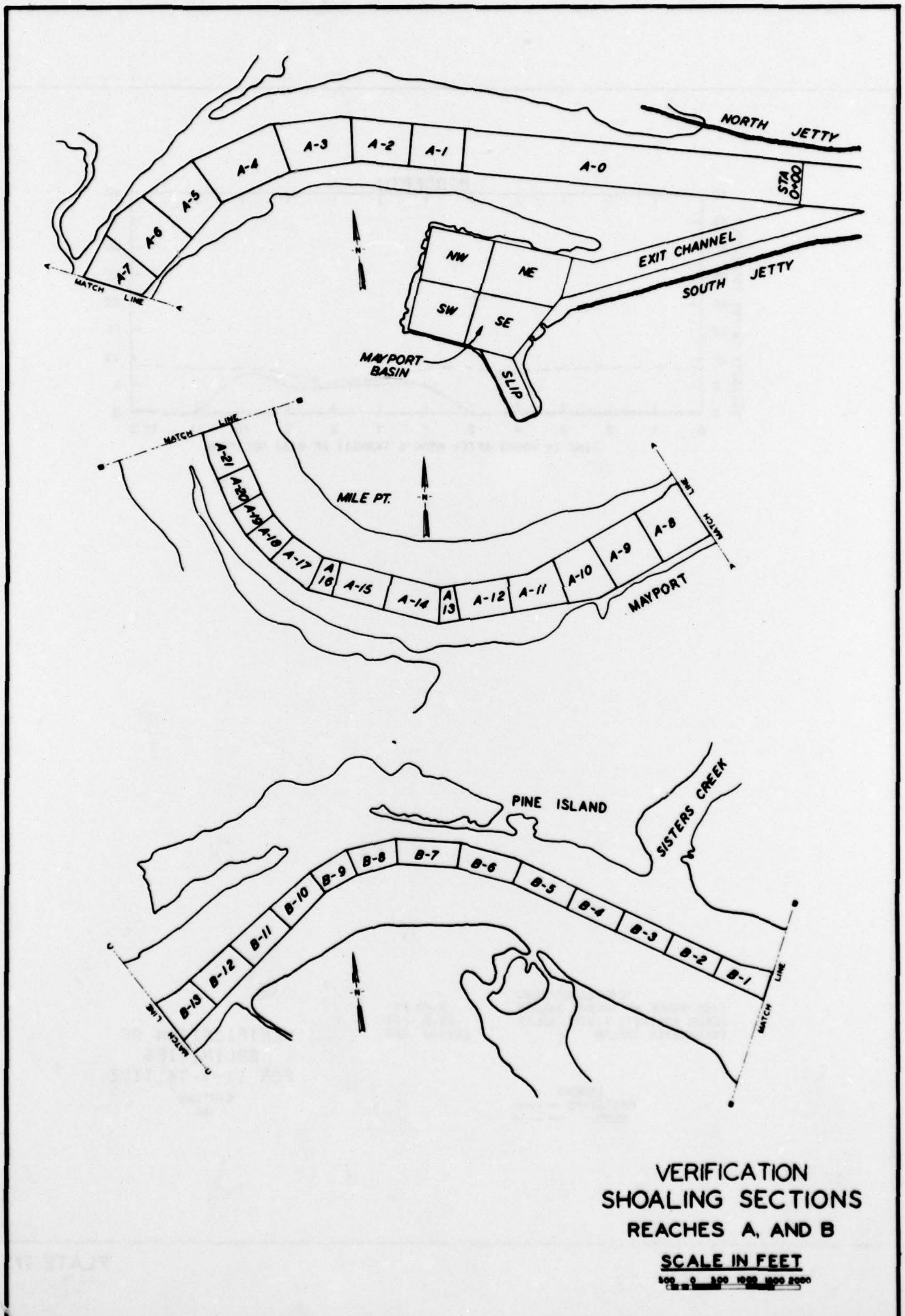
TEST CONDITIONS

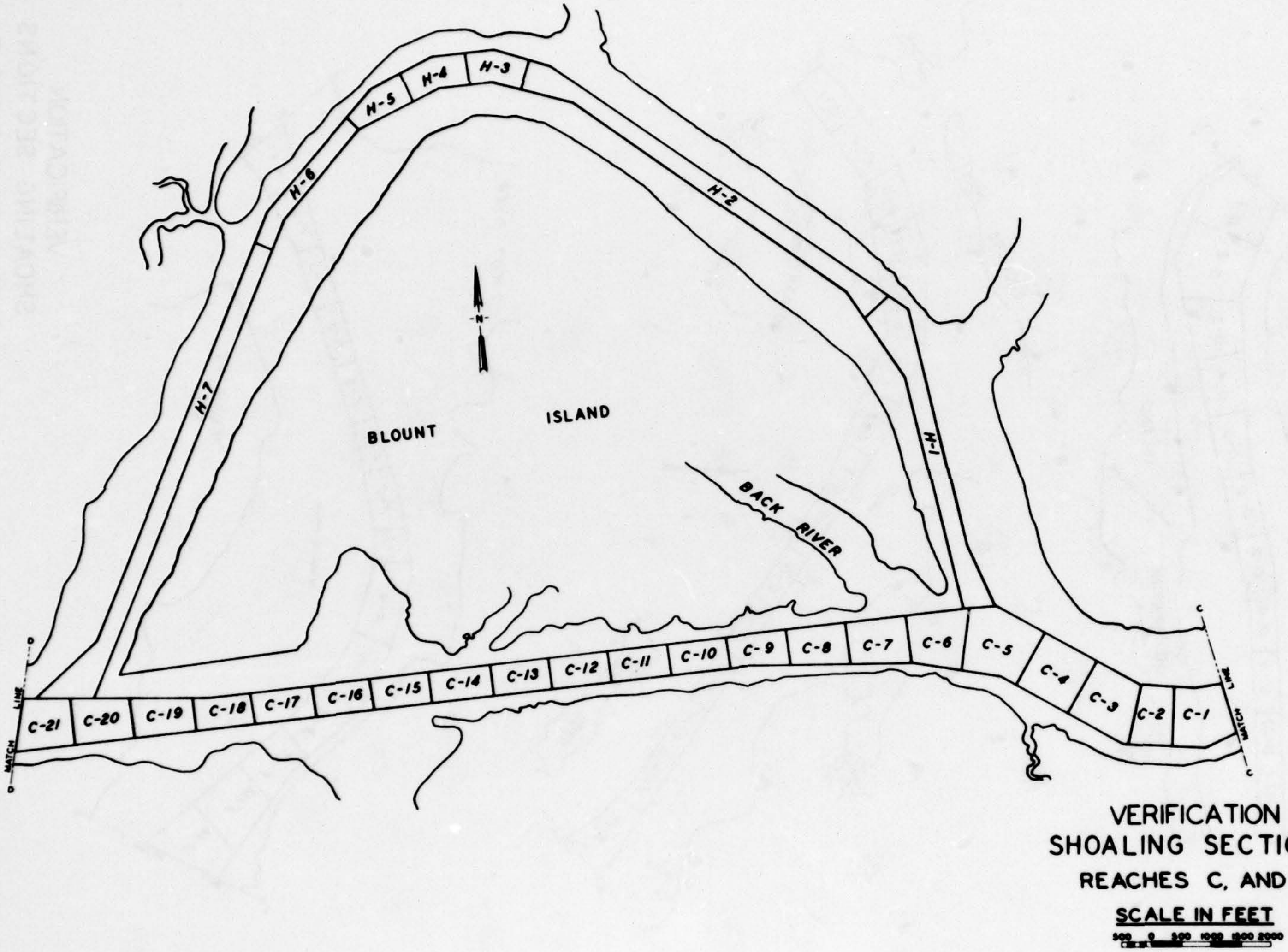
TIDE RANGE AT TALBOT ISLAND	5.40	FT
OCEAN SALINITY (TOTAL SALT)	33.0	PPT
FRESHWATER INFLOW	8940.0	CFS

LEGEND
PROTOTYPE ———
MODEL — — —

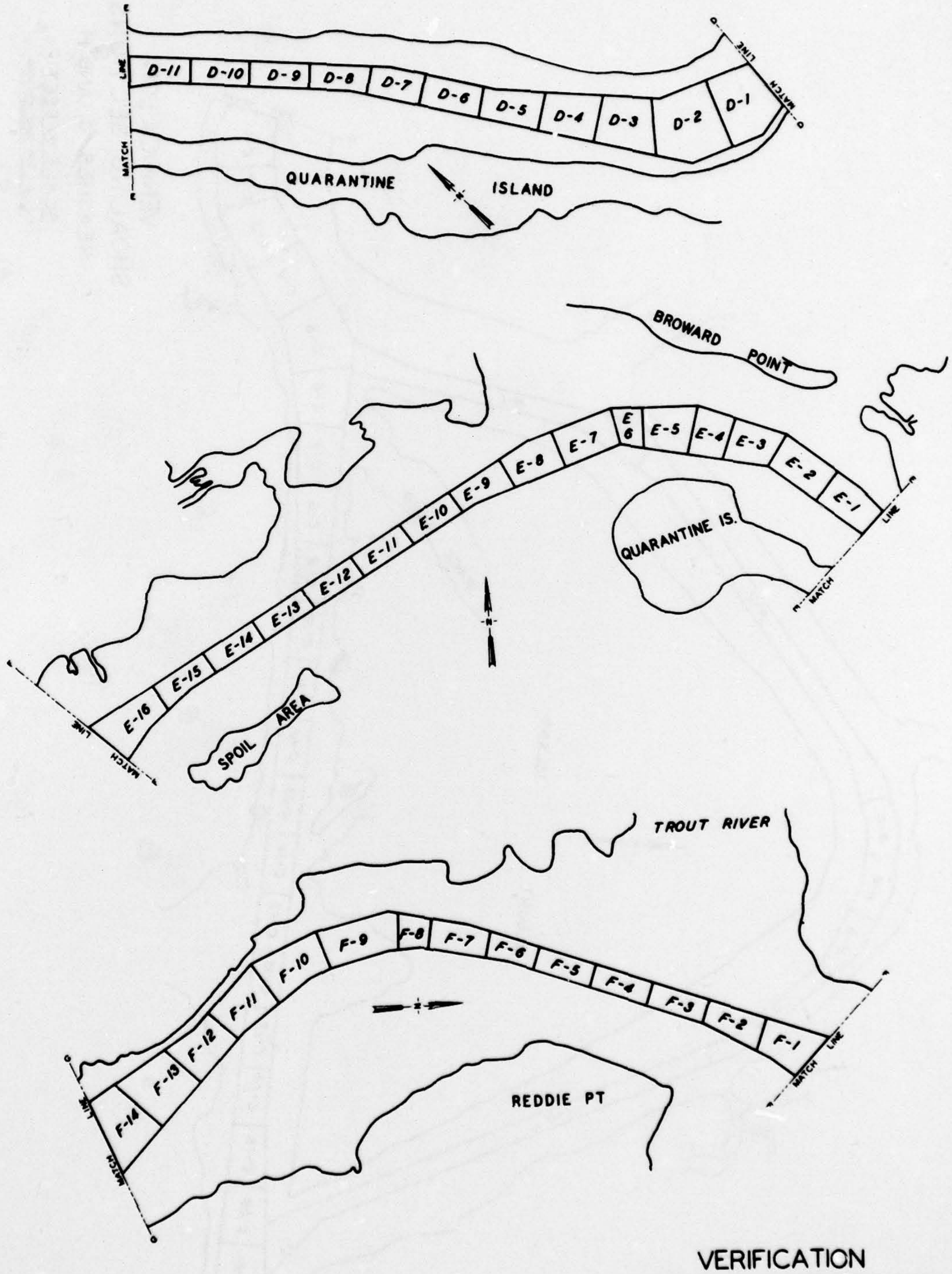
VERIFICATION OF
SALINITIES
FOR 11-7-74 TIDE

STATION
10C


NORTH JETTY
A-0
A-1
A-2
A-3
A-4
A-5
A-6
A-7
STA 0+00
EXIT CHANNEL
SOUTH JETTY
NW
NE
SW
SE
MAYPORT BASIN
SLIP
MATCH LINE
A-21
A-20
A-19
A-18
A-17
A 16
A-15
A-14
A 13
A-12
A-11
A-10
A-9
A-8
MILE PT.
MAYPORT
PINE ISLAND
SISTERS CREEK
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
B-9
B-10
B-11
B-12
B-13
VERIFICATION
SHOALING SECTIONS
REACHES A, AND B
SCALE IN FEET
500 0 500 1000 1500 2000



VERIFICATION
SHOALING SECTIONS
REACHES C, AND H

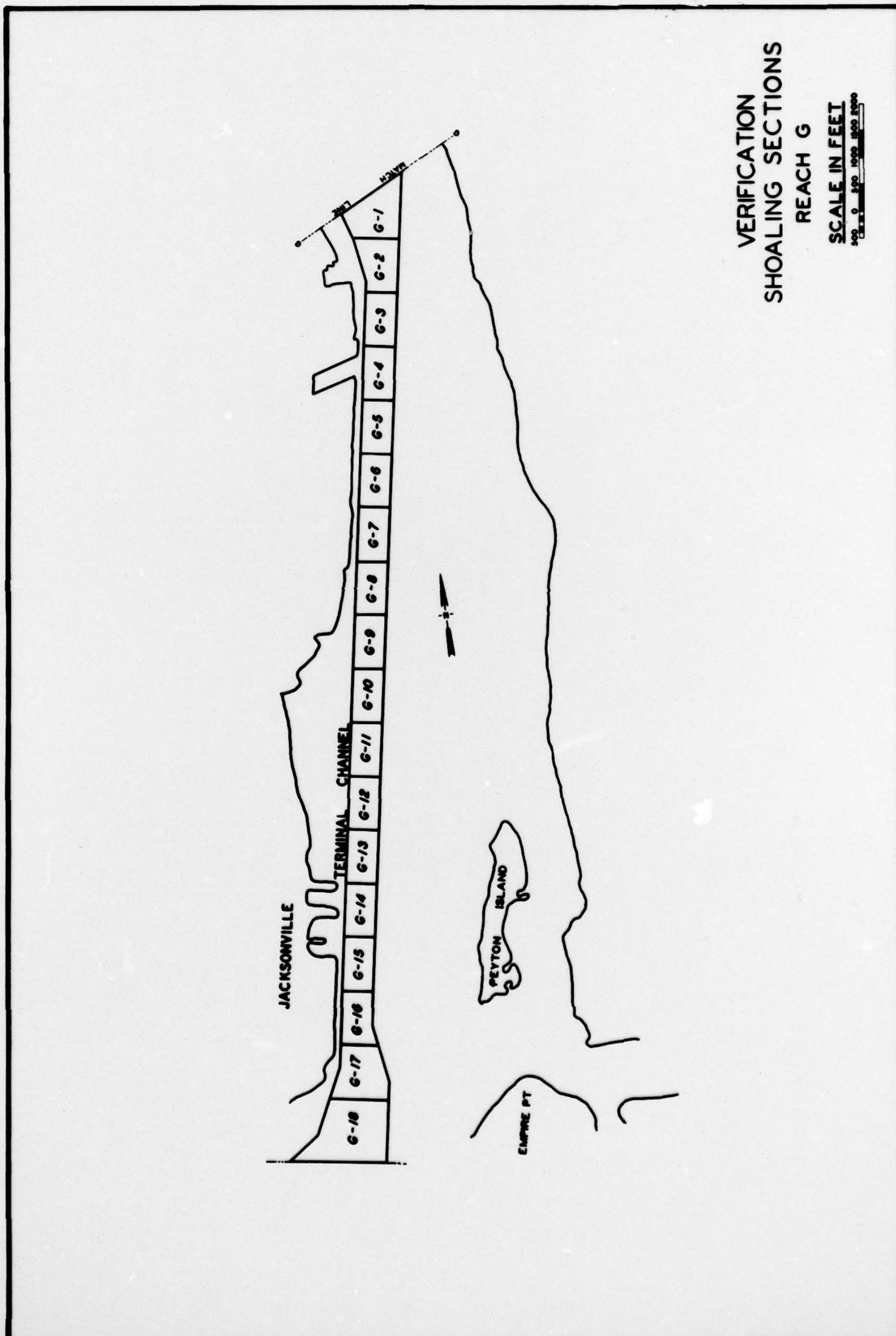


VERIFICATION
SHOALING SECTIONS
REACHES D, E, AND F

SCALE IN FEET

500 0 500 1000 1500 2000

PLATE 176


VERIFICATION
SHOALING SECTIONS
REACH G
SCALE IN FEET
MATCH LINE
JACKSONVILLE
TERMINAL CHANNEL
PEYTON ISLAND
EMPIRE PT
G-1
G-2
G-3
G-4
G-5
G-6
G-7
G-8
G-9
G-10
G-11
G-12
G-13
G-14
G-15
G-16
G-17
G-18

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Brogdon, Noble J
  Mayport-Mill Cove model study; Report 1: Hydraulic, salinity, and shoaling verification; hydraulic model investigation / by Noble J. Brogdon, Jr. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1979.
  40, [5] p., 177 leaves of plates : ill. ; 27 cm. (Technical report - U. S. Army Engineer Waterways Experiment Station ; HL-79-12, Report 1)
  Prepared for U. S. Army Engineer District, Jacksonville, Jacksonville, Florida.

1. Fixed-bed models. 2. Hydraulic models. 3. Mayport-Mill Cove. 4. Model verification. 5. Prototype confirmation. 6. Salinity. 7. Shoaling materials (Models). 8. Tidal models. I. United States. Army. Corps of Engineers. Jacksonville District. II. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Technical report ; HL-79-12, Report 1.
TA7.W34 no.HL-79-12 Report 1