Atlas of Tidal Elevation and Current Observations on the Northeast American Continental Shelf and Slope

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Atlas of Tidal Elevation and Current Observations on the Northeast American Continental Shelf and Slope

By John A. Moody[1], Bradford Butman[1], Robert C. Beardsley[2], Wendell S. Brown[3], Peter Daifuku[4], James D. Irish[3], Dennis A. Mayer[5], Harold O. Mofjeld[6], Brian Petrie[7], Steven Ramp[8], Peter Smith[7], *and* W. R. Wright[8]

Abstract

Measurements of sea-surface elevation or bottom pressure at 100 stations and measurements of current at various depths at 139 stations on the North American Continental Shelf from Cape Hatteras to the Laurentian Channel have been analyzed using either the harmonic or the response method for five tidal constituents: the semidiurnal tides M_2 (12.42 hours), N_2 (12.66 hours), and S_2 (12.00 hours), and the diurnal tides K_1 (23.93 hours) and O_1 (25.82 hours). The amplitude and phase of elevation and of east and north current for the five constituents are presented in tables. The ellipse representation of the current is also tabulated. In addition, plates are presented showing tidal elevation and surface current (for M_2, N_2, S_2 K_1 and O_1) and representative current ellipses (for M_2, K_1 and O_1). This is the first compilation of tidal elevation over this region of the Continental Shelf for constituents other than M_2 and of tidal currents at depths other than at the surface.

The coamplitude and cophase lines for all semidiurnal tides are similar and indicate a co-oscillating tide in the Middle Atlantic Bight and on the Scotian Shelf, and a near-resonant tide in the Gulf of Maine. There is an amplitude minimum of the sea-surface elevation over Nantucket Shoals and Georges Bank. The diurnal tides (K_1 and O_1) are dominated by an amphidromic point near Sable Island and a secondary amphidromic point in the Middle Atlantic Bight. Along the remainder of the shelf the diurnal tide seems to be a combination of Kelvin and shelf waves.

The major axis of the M_2 tidal current ellipses are generally oriented perpendicular to the local isobaths except near the coast and in the Great South Channel and Northeast Channel. In contrast, the major axis of the ellipses of the two diurnal constituents are generally oriented parallel to the isobaths. The amplitude of the M_2, K_1, and O_1 surface current is weakest at the outer edge of the shelf, reaches a maximum midway across the shelf, and then decreases toward the coast. The variability of the tidal current estimates is largest near the shelf break where some contribution from a baroclinic tide is expected.

Observations at five stations, where current measurements were made at 1 and at 10 to 20 meters above the bottom, were used to empirically determine the vertical structure of the M_2 semidiurnal current near the bottom. The amplitude of the M_2 bottom current is typically about 50 percent of the amplitude of the near-surface current. The empirical curve was used to estimate the bottom tidal currents (1 meter above the bottom) at 78 locations on the Continental Shelf where measurements were available only at 10- to 20-m above the bottom.

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INTRODUCTION

This atlas is a compilation of tidal constants for current and pressure made at 216 locations on the North American Continental Shelf from Cape Hatteras to the Laurentian Channel. In recent years, measurements of current and bottom pressure have been made over the Continental Shelf and Slope in numerous field experiments conducted by many investigators. The primary objective of most of these field programs was to study the

kinematics and dynamics of the low-frequency and seasonal mean circulation. While some of the experiments were designed specifically to examine the tides, the spatial coverage of most of the individual experiments was generally limited. As a result, tidal analysis of the new current and pressure data obtained in these experiments has been scattered and incomplete and has generally been limited to the dominant M_2 semidiurnal component. This atlas presents in graphical and tabular form the tidal constants determined from data obtained in these recent field experiments. In addition, constants obtained from the literature for selected coastal stations are also included for completeness. A brief description of the major features of the observed surface tides and tidal currents is also presented.

Previous observations of the tides in the region are limited. Haight (1942) reported surface tidal-current measurements made at anchored lightships landward of the 60-m isobath. A few tidal constants from pressure observations made along the edge of the shelf in water more than 100 m deep were compiled by Cartwright and others (1979). There are several references to tidal constants, most as parts of papers on other topics (Greenberg, 1975; Beardsley and others, 1977b; Mayer and others, 1979; Vermersch and others, 1979; Moody and Butman, 1980; Mayer, 1982a and 1982b). Tidal constants along the United States coast are available from the Tides Branch of the National Ocean Service and along the Canadian coast from the Canadian Hydrographic Service (1966 and 1969a). Syntheses of semidiurnal tidal observations have been presented by Redfield (1953) for the Gulf of Maine and by Redfield (1958) and Swanson (1976) for the Middle Atlantic Bight. A synthesis of K_1 tidal observations has been presented by Daifuku (1981).

The data presented in this atlas were obtained along the North American Continental Shelf from Cape Hatteras to the Laurentian Channel (plate 1). This region can be divided geographically into four major areas: the Middle Atlantic Bight, Georges Bank, the Gulf of Maine, and the Scotian Shelf. The Middle Atlantic Bight extends from Cape Hatteras northward to Nantucket Shoals. The shelf is quite narrow (<75 km) and shallow (~ 40 m) in the southern part of the bight and becomes wider (125 km) and deeper (~ 60 m) south of Cape Cod. The sea floor in the Middle Atlantic Bight is quite smooth. To the northeast of the Middle Atlantic Bight is Georges Bank, a shallow submarine bank located on the south side of the Gulf of Maine. The bank is about 300 km long and 150 km wide and is separated from Nantucket Shoals by the Great South Channel (~ 70 m deep) and from the Scotian Shelf by Northeast Channel (~ 230 m deep). The water on the crest of Georges Bank is generally 30–40 m deep, although less than 5 m deep in some places. The Gulf of Maine is about 400 km long and 250 km wide. Three major basins and numerous smaller basins in the Gulf of Maine are more than 260 m deep. The basins are separated by a series of ledges, ridges, and swells. The bottom topography is complex and rough, especially in the north-central region and west of Nova Scotia. The Scotian Shelf is wider (150–200 km), deeper, and topographically rougher than the Middle Atlantic Bight. Browns Bank on the western end of the shelf, the shelf around Sable Island, and Banquereau Bank adjacent to the Laurentian Channel all are less than 60 m deep. There are two deep basins (>240 m) and two banks (<60 m) southwest of Halifax. The Laurentian Channel, which is greater than 400 m deep, cuts across the Scotian Shelf between Nova Scotia and Newfoundland and is the northern limit of this study.

The tides and tidal currents on the Continental Shelf clearly affect many physical processes, and thus a description of the tides has many applications. For example, the strength of the tidal currents influences the surface-sediment distribution and the short- and long-term fate of material and pollutants introduced into the water column (Bothner and others, 1981; Twichell and others, 1981). The tides also influence the extent of vertical mixing on Georges and Browns Bank and on Nantucket Shoals, and thus partially determine the location of hydrographic fronts (Garrett and others, 1978). The clockwise mean circulation observed around Georges and Browns Bank may be partially caused by rectification of the strong tidal currents (Loder, 1980; Butman and others, 1982; Hopkins and Garfield, 1982; Butman and others, 1983; Smith, 1983). Both the vertical mixing and the clockwise circulation may indirectly affect the biological productivity of the region by controlling the vertical distribution of nutrients and organisms and the advection of eggs and larvae.

A description of the tidal currents is important for parameterization of bottom stress in analytical and numerical models of the subtidal circulation where the tidal currents are not explicitly included (Noble and others, 1983). In addition to direct effects of the tides, a description of the tides is important for removing the large but predictable tidal signal where it masks other signals of interest. For example, in order to determine the low-frequency variability of sea level from observations made by satellite, the tidal signal must be known. Finally, tidal information has been used to improve geophysical models of tidal loading of the earth's crust (Beaumont and Boutilier, 1978).

This atlas of tidal constants for elevation and current includes recent tidal observations as well as selected observations from the literature. It is intended to serve as a reference document of the tides along the northeast coast of North America. It is the first compilation to include the M_2, N_2, S_2, K_1, and O_1 constituents both for sea-level elevation and for currents at various depths.

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DATA SET

The tidal constants (amplitude and phase) for elevation and current in this atlas have been compiled from observations made by several investigators at 216 stations on the Continental Shelf and Slope from Cape Hatteras northward to the Laurentian Channel (plate 1). For convenience, the stations are grouped geographically into twelve areas: Scotian Shelf, Gulf of Maine, Bay of Fundy, Northeast Channel, Georges Bank, Great South Channel, Lydonia Canyon, Nantucket Shoals, New England Shelf, Middle Atlantic Bight, southern Mid-Atlantic Bight, and Oceanic (see plate 1 and tables 4–9). Table 3 lists the stations alphabetically, the type of instrument used to make the measurement, the method of tidal analysis (see "Data analysis" below), and the data source. The station names used by the investigators who made the measurements have been used to simplify comparison with references in other papers.

The vertical distribution of the current observations made in each region is shown in plate 2. There were typically 1 to 4 observations at each station. Observations 1 m above bottom (hereafter mab) were obtained at a few stations. The spatial coverage is densest in the northern Middle Atlantic Bight and on Georges Bank and sparser in the southern Middle Atlantic Bight and on the Scotian Shelf. The measurements in the Gulf of Maine are extremely limited. Only a few measurements were made in water depths greater than 100 m, primarily on the Scotian Slope, around Lydonia Canyon, and on the slope between longitudes 70° and 73°W.

The data presented in this atlas were obtained in several ways. All data were compiled, tabulated, and plotted by J. Moody. In most cases, investigators computed the tidal constants from their data using their own tidal analysis programs. In other cases, investigators provided the original time series, and the tidal constants were computed by J. Moody. Additional tidal constants, primarily of coastal sea level, were obtained from the literature. All investigators who contributed raw data or tidal constants from more than one station are authors of this atlas. J. Moody and B. Butman wrote the text.

DATA ANALYSIS

The tidal constants (amplitude and phase) for elevation and east and north current components were determined for the five major constituents listed in table 1. These five tidal constituents typically account for more than 80 percent of the total variance of current observations in the Georges Bank region (based on observations at stations A, C, D, and L), and for 30 to 40 percent in the Middle Atlantic Bight (based on observations at station MB). On the Continental Slope, the five constituents accounted for only 5 percent of the total current variance (based on observations at station MF). The five major tidal constituents (based on observations at stations A, B, D, K, MB, MC, MD, ME, P, Q, and R) accounted for more than 85 percent of the total variance in sea-level elevation and more than 93 percent of the variance at periods shorter than 33 hours.

Tidal constants were determined by using either the response method (Munk and Cartwright, 1966) or the harmonic method (Schureman, 1941; Dennis and Long, 1971). At two stations (M and LT5), the constants were computed by both methods, and the difference between current amplitude was less than 1 cm/s for all constituents except the S_2 semidiurnal tide. The phase estimates differed by 4° to 6° and the estimates of ellipse orientation differed by 4° to 30° with the larger difference occurring again for the solar semidiurnal constituent.

Bottom-pressure observations on the shelf and slope, which were converted to height in centimeters for comparison with elevations measured at coastal stations, are referred to as tidal elevations (1 mb = 0.995 cm). All

Table 1. Characteristics of the five tidal constituents described in this atlas. Equilibrium tide is computed for latitude 42°N.

Symbol	Period (hr)	Speed (deg/hr)	Equilibrium Tide (cm)	Description
M_2	12.4206	28.984	13.4	Lunar semidiurnal.
N_2	12.6583	28.440	2.6	Large lunar elliptic.
S_2	12.0000	30.000	2.9	Solar semidiurnal.
K_1	23.9345	15.041	14.1	Luni-solar diurnal.
O_1	25.8193	13.943	10.0	Lunar diurnal.

observations of phase were converted to the Greenwich phase, G, which is independent of both longitude and the time meridian (fig. 1). National Ocean Service tidal constants are generally listed in terms of the local phase, κ, and have been converted according to

$$G = \kappa + pL,$$

where p equals 1 and 2 for diurnal and semidiurnal tides, respectively, and L is the west longitude of the station expressed in degrees. Canadian Hydrographic Service tidal constants are listed by the local Greenwich phase, g, and have been converted according to

$$G = g + aS/15,$$

where a is the angular constituent speed in degrees per hour (see table 1) and S is the west longitude of the time meridian expressed in degrees.

The tidal current can be represented as eastward and northward current components or as a tidal ellipse. The tidal ellipse parameters are the amplitude of the major axis (UMAJOR), amplitude of the minor axis (UMINOR), orientation of the major axis (ORIEN), and time of maximum current (PHASE). If the east and north currents at frequency ω are expressed as

$$\text{east} = U \cos(\omega t - \phi_u),$$
$$\text{north} = V \cos(\omega t - \phi_v),$$

where (U, V) and (ϕ_u, ϕ_v) are the amplitude and phase for the east and north current components, respectively, then the corresponding ellipse parameters are given by

$$\text{UMAJOR} = |U_+| + |U_-|,$$
$$\text{UMINOR} = |U_+| - |U_-|,$$

$$\text{PHASE} = \tfrac{1}{2} \tan^{-1}\left[\frac{2(A_1B_1 + A_2B_2)}{A_1^2 - B_2^2 + A_2^2 - B_1^2}\right],$$

$$\text{ORIEN} = \tfrac{1}{2} \tan^{-1}\left[\frac{2(A_1A_2 + B_1B_2)}{A_1^2 + B_1^2 - (A_2^2 + B_2^2)}\right],$$

where

$$A_1 = U \cos \phi_u \quad , \qquad A_2 = V \cos \phi_v \quad ,$$
$$B_1 = U \sin \phi_u \quad , \qquad B_2 = V \sin \phi_v \quad ,$$

and

$$|U_+| = \tfrac{1}{2}[(A_1 + B_2)^2 + (A_2 - B_1)^2]^{1/2} \ ,$$
$$|U_-| = \tfrac{1}{2}[(A_1 - B_2)^2 + (A_2 + B_1)^2]^{1/2} \ ,$$

In this representation, the orientation is measured counterclockwise from east.

Given an ellipse with major and minor axis twice the length of UMAJOR and UMINOR, and with the major axis oriented toward the ellipse orientation, ORIEN, the tidal current flows in the direction of a vector that originates at the center of the ellipse and terminates on the perimeter. The tip of the tidal-current vector sweeps around the ellipse in one tidal period and reaches a maximum equal to UMAJOR twice in a tidal cycle, when $\omega t = \text{PHASE} (\pm 180°)$. The angle that the current vector makes with north is

$$\alpha = 90° - \tan^{-1}((V\cos(\omega t - \phi_v))/U\cos(\omega t - \phi_u)).$$

If UMINOR is negative, the current vector rotates clockwise. If UMINOR is positive, the current vector rotates counterclockwise. The maximum excursion that a water particle travels in a tidal cycle is UT/π, where U is the current amplitude (either UMAJOR or east or north component) and T is the tidal period. For the M_2 tide, the tidal excursion (in km) is 0.142U, where U is in cm/s.

When the tidal constants were determined by the harmonic method (Dennis and Long, 1971), the data records were broken into 29-day pieces and the constants determined for each piece. Some investigators, however, used a modified harmonic analysis that was not restricted to 29-day data pieces. For records consisting of more than one piece, the average amplitude and phase were computed as a vector average of the amplitudes and phases determined for each piece. The scalar standard deviations of the amplitude and phase (and of the ellipse parameters) were computed as an estimate of the variability of the constants. An estimate of the uncertainty for some of the constants computed by the response method was based on the 95 percent confidence limits (Daifuku, 1981). At stations for which no estimates of the confidence limits were computed, the record length is an approximate indicator of the reliability of the constants.

The average standard deviation for tidal elevation was computed for the 25 stations where standard deviations were available (table 2). The average standard deviation of elevation amplitude for all constituents ranged from 0.5 to 0.7 cm, or about 1 percent of the amplitude for the dominant M_2, about 4 percent for the N_2 and S_2, and about 9 percent for the K_1 and O_1. The average standard deviation of phase was 1°–3° for the semidiurnal constituents and 4° for the diurnal constituents.

The tidal constants for current (both amplitude and phase) were more variable than those for elevation. The average standard deviation of current for all observations at less than 50 m from the surface was 1.4 cm/s for M_2 and less than 1.0 cm/s for the other constituents (table 2). This average standard deviation for current was 9 percent

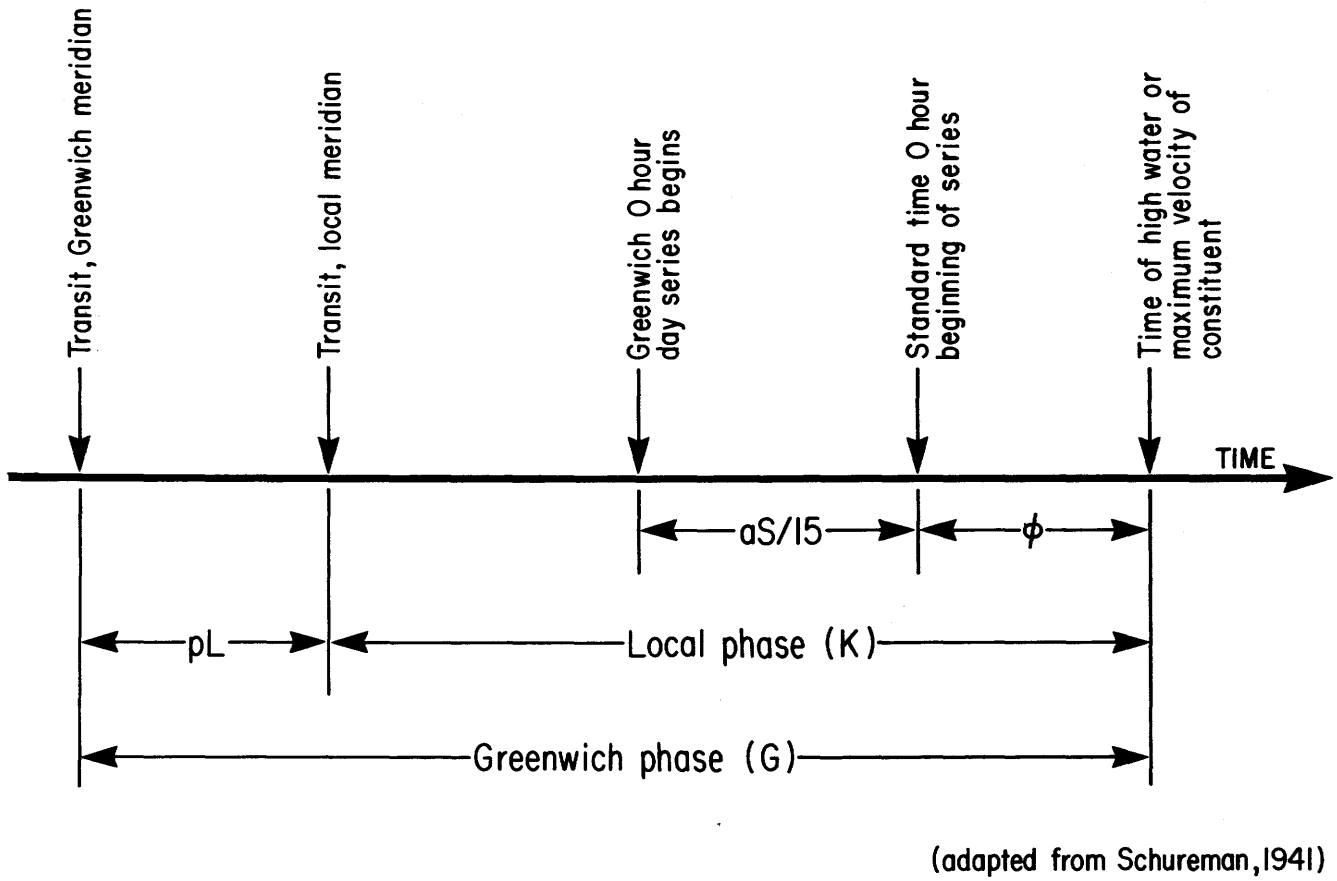

Figure 1. Phase relationships. p, subscript of the constituent (2 = semidiurnal, 1 = diurnal); L, longitude in degrees of the station (positive-west); S, longitude of the time meridian in degrees (positive-west); a, angular speed of the constituent; and ϕ, phase relative to the beginning of the series (adapted from Schureman, 1941).

of the amplitude for the dominant M_2 and greater than 20 percent of the amplitude for the other constituents. Standard deviation of the phase and orientation estimates were about 10° for M_2, and between 20° and 30° for N_2, S_2, K_1, and O_1. In summary, these estimates suggest errors in amplitude of about 1 cm for elevation and about 1 cm/s for current, and phase errors of less than 4° for elevation, about 10° for M_2 current, and 20° to 30° for N_2, S_2, K_1, and O_1 current.

Several types of instruments were used to make the current observations reported here (see table 3). Most observations were made in water less than 100 m deep where oscillatory currents associated with surface waves can (by rotor pumping) increase the current speeds recorded by current meters. Speed errors can be as large as a factor of 2 for certain types of instruments on certain types of moorings (Halpern and Pillsbury, 1976; Beardsley and others, 1977). The data collected using Aanderaa instruments at shallow water stations are suspect. For example, Mayer and others (1979) found that the kinetic energy of the semidiurnal tidal currents measured using Aanderaa instruments (at 7–30 m) at station LTM in the Middle Atlantic Bight varied by a factor of 2 during the year and that the maximum values were reached in the winter months when surface waves were large. The surface measurements at LTM were decoupled from the

Table 2. Estimates of the error in tidal elevation and current for five tidal constituents. For elevation, all stations (25) with standard deviations listed in table 4 were used to compute average standard deviations of amplitude and phase. For current, all observations at depths less than 50 m, and at 1 meter above bottom were used to compute average standard deviations of ellipse amplitude, phase and orientation.

	M_2	N_2	S_2	K_1	O_1
Elevation					
σ Amplitude (cm)	0.6	0.6	0.5	0.7	0.6
σ/Amplitude (%)	1.3	4.5	4.3	8.3	9.1
σ Phase (deg)	1	3	2	4	4
Current					
σ Amplitude (cm)	1.4	1.0	0.6	0.9	0.5
σ/UMAJOR amp. (%)	9	28	21	22	22
σ Phase (deg)	11	21	22	29	30
σ Orientation (deg)	7	20	18	27	25

σ is standard deviation

subsurface float by using a special wave-following spar buoy; the errors for the instrument at 8 mab were small because of the location of the subsurface float and the stiffness of the mooring (Mayer and others, 1979). Only surface and near-bottom measurements at LTM are included in this atlas. Observations at some other stations made by means of Aanderaa current meters (C3, C5, CMICE, LT2, LT3, MAB, NJ4, S2, and SS10) indicate a maximum in the velocity of the tidal current at mid-water depths. The tidal constants for these observations may be contaminated by rotor pumping and should be used with caution. There is no evidence to suspect observations obtained with VACM's. For example, tidal constants computed from the long-term measurements obtained at station A on Georges Bank showed no seasonality. No corrections were made to any of the tidal constants for errors caused by rotor pumping; they were tabulated as calculated by the investigators.

The tidal-current constants presented in this atlas are estimates of the amplitude and phase of the tides obtained from each data record. No attempt was made to estimate or remove the contribution of the internal tide, if any, to the measurements. In general, the presence of internal tides will probably cause increased variability in the amplitude and phase of the tidal constituents because they are transient and not usually phase-locked to the astronomical forcing. The internal tides were apparently strongest at stations on the Continental Slope where the variability was large in comparison with the variability at stations on the Continental Shelf.

Current measurements from five stations (K, A, MB, Q and LCA) were selected to represent different tidal environments on the Continental Shelf. Station K represents a turbulent environment near the crest of Georges Bank where typical surface tidal currents are 50 to 60 cm/s in 60 m of water over a mobile bottom covered by fine sand with small ripples. At station A on the southern flank of Georges Bank, the water depth is 85 m; the typical tidal current is 30 to 40 cm/s, and the bottom surface sediment is fine sand with occasional small ripples. Station MB, in the Middle Atlantic Bight, is in 60 m of water and there are weak tidal currents of 14 to 16 cm/s over a sand bottom (Butman and Moody, 1983). Station Q in 67 m of water has current speeds of 15 to 20 cm/s with a smooth mud bottom. Station LCA is in 100 m of water at the edge of the Continental Shelf with surface tidal currents of 34 cm/s and a bottom covered by sand. Current measurements at these five stations were made at 1 mab by means of a bottom tripod system (Butman and Folger, 1979) and at several depths above the bottom by means of an EG&G VACM. The observations at these stations were used to determine a simple empirical method for estimating currents 1 mab at other stations. The vertical length scale for the frictional bottom layer is about 10 m. At each station the amplitude of the major axis of the tidal ellipse (UMAJOR) was normalized by a value of UMAJOR above the bottom boundary layer, typically 20 to 30 mab. Although somewhat scattered, the normalized observations from quite different tidal environments fall on a relatively smooth curve (fig. 2). The amplitude of the major axis of tidal current ellipse 1 mab was about 0.5 times the amplitude of the major axis in the interior. The average difference in phase and ellipse orientation (interior minus bottom) was 17° and −14°, respectively, at stations A, K, LCA, MB, and Q. Thus, maximum near-bottom current occurred before maximum mid-depth current, and the near-bottom ellipse was rotated slightly to the right of the mid-depth ellipse.

The empirical curve (fig. 2) and the average ellipse and phase differences given above have been used to estimate the amplitude of the near-bottom tidal currents, given observations 10–30 mab. The vertical structure of the weaker and more variable N_2 and S_2 components was similar to that of the M_2 component. The vertical structure of the diurnal tides could not be determined because the vertical changes were much smaller than the 20 to 30 percent uncertainty of the current amplitude and 20° to 30° uncertainty in phase and ellipse orientation.

RESULTS AND DISCUSSION

The amplitude and the Greenwich phase for the tidal constituents M_2, N_2, S_2, K_1, and O_1 are listed for 100 stations in table 4. There are 34 coastal stations, 53 stations on the Continental Shelf, 10 on the slope, and 3 oceanic reference stations. The coastal stations were selected to represent the tide along the edge of the shelf; stations in local harbors or estuaries are not included. Data from only a few of the Canadian stations along the coast of Nova Scotia and in the Bay of Fundy are tabulated in this atlas (for all stations, see Canadian Hydrographic Service, 1969a). The amplitude and Greenwich phase of the northward and eastward current components and the ellipse parameters for the five tidal constituents M_2, N_2, S_2, K_1, and O_1 are listed in tables 5–9.

The tidal elevation and current observations are briefly discussed in the following sections and presented graphically as plates at the end of this atlas.

Tidal Elevation

Tidal Character

The character of the tide in a particular region can be described in terms of the ratio, $F=(K_1+O_1)/(M_2+S_2)$.

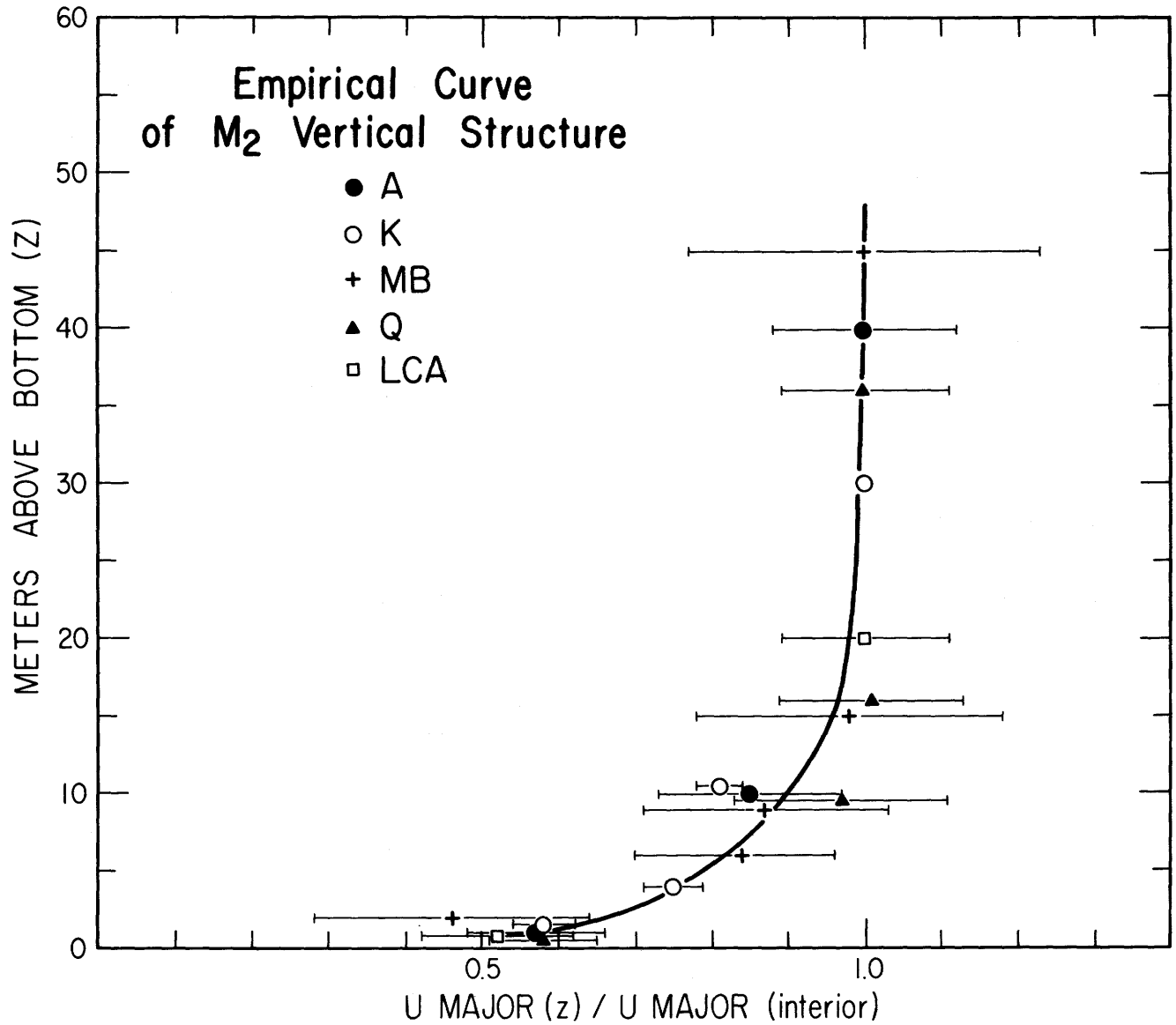

Figure 2. Vertical structure of normalized M_2 near-bottom current. Amplitude of the major axis of the M_2 tidal current ellipse at stations A, K, LCA, MB, and Q, normalized by the velocity observed at 40, 30, 20, 45, and 35 mab, respectively. The error bars are ±1 standard deviation and are zero for the observation at 30 mab (station K). For clarity, the plotted values at 1 mab have been slightly separated vertically. The solid line is a log curve from 0 to 15 mab, and is fit by eye above 15 mab. This empirical curve was used to extrapolate current measurements less than 20 mab to 1 mab (see plate 11).

Defant (1958) provides the following interpretations for F:

F = 0.0 – 0.25, semidiurnal;
F = 0.25 – 1.50, mixed, predominantly semidiurnal;
F = 1.50 – 3.00, mixed, predominantly diurnal; and
F > 3.00, diurnal.

Values of F varied between 0.05 and 0.48, indicating mixed but predominantly semidiurnal nature of the tide in this region (plate 3). Values of F lower than 0.20 occurred mostly in the Gulf of Maine and the lowest values of F were found at the head of the Bay of Fundy.

M_2 Tide

The coamplitude and cophase lines of the M_2 semidiurnal tide (12.42 hours) shown in plate 4 are similar to the mean coamplitude and cophase lines published by Redfield (1953) for the Gulf of Maine and by Redfield (1958) and Swanson (1976) for the Middle Atlantic Bight. The phase (~350°) and amplitude (~40 cm) were nearly constant along the shelf break from Sable Island to Cape Hatteras. A feature not shown on earlier maps is an amplitude minimum (30–40 cm) centered over Nantucket

Shoals and Georges Bank. The M_2 tide is predominantly a progressive, refracted wave across the shelf in the Georges Bank region, near co-oscillation in the Middle Atlantic Bight and on the Scotian Shelf, and near resonance with the 13.3 hr natural period of the Gulf of Maine (Garrett, 1972 and 1974). The amplitude of the M_2 increased from 40 cm at the shelf break to above 400 cm in the Bay of Fundy. Predictions by Redfield (1958) of the M_2 amplitude and phase based on a damped, co-oscillating model agree very well with observations southwest of Hudson Canyon and less well with those made in the transition region (from co-oscillation to progressive wave) northeast of Hudson Canyon (71°30′W).

N_2 Tide

The coamplitude and cophase lines of the N_2 tide (12.66 hours) in plate 5 are similar to those of the M_2 tide in plate 4. However, the amplitude of the N_2 tide is about 20 to 25 pecent of the amplitude of the M_2, slightly more than the mean N_2/M_2 ratio (19 percent) for the equilibrium tide (Schureman, 1941).

S_2 Tide

The coamplitude and cophase lines for the solar semidiurnal S_2 tide (12.00 hours) shown in plate 6 are also similar to those for the lunar semidiurnal M_2 tide (plate 4). The observed amplitude ratio S_2/M_2 (0.20–0.25) is nearly the same as for the equilibrium tide (0.21) over most of the continental Shelf, except in the Gulf of Maine and Bay of Fundy where it decreases to 0.10–0.18. Garrett (1972) has suggested that this decrease indicates that the Gulf of Maine and the Bay of Fundy are a single tidal system separate from the Continental Shelf.

K_1 Tide

The K_1 tide (23.93 hours) has a distinct amphidromic point near Sable Island (plate 7), shown previously by Dohler (1954). Two possible amphidromic points are located near Cape Cod and Atlantic City, N.J. On the Scotian Shelf, the amplitude of the K_1 tide resembles a shelf wave; the amplitude decreases from 6–12 cm near the coast to 4–8 cm near the shelf break. The along-shelf phase velocity is about 50 km/hr. This is the same order of magnitude as the predicted phase speed of first-mode diurnal shelf waves along Vancouver Island (10 km/hr, Crawford and Thomson, 1982), the Scottish Shelf (25 km/hr, Cartwright and others, 1980), and the New England Shelf (20 km/hr, Daifuku, 1981). In contrast, the K_1 tide in the Middle Atlantic Bight is dominated by a Kelvin wave with a phase speed of about 500 km/hr (Daifuku, 1981; Daifuku and Beardsley, 1983). The K_1 period is about twice the 13.3 hour resonant period (Garrett, 1972) for the Gulf of Maine and thus there is only a modest amplification of the tidal elevation from 8 cm on Georges Bank to 16 cm at the head of the Bay of Fundy. In contrast, the near-resonant M_2 amplitude increases 8-fold over the same area.

O_1 Tide

The major feature of the O_1 tide (25.82 hours) is an amphidromic point near Sable Island (plate 8), similar to the K_1 tide. In this region of the Scotian Shelf, the amplitude of the O_1 tide is constant across the shelf, rather than decreasing as the K_1 tide. In the Gulf of Maine, the amplitude of the O_1 tide increases about 70 percent from the shelf break, and reaches a maximum of 12 cm approximately halfway into the Bay of Fundy. The amplitude then decreases toward the head of the Bay of Fundy. In contrast, on the shelf south of New England, the amplitude of the O_1 tide decreases from a maximum of 7–8 cm seaward of the shelf break to 4–5 cm at the coast. This is similar to the idealized cotidal map published by Cartwright and others (1980) for the K_1 constituent on the Scottish Shelf where there is a superposition of a Kelvin wave and a shelf wave of approximately equal amplitude but out of phase. This superposition produced a virtual amphidrome, where the amplitude decreases rapidly toward the coast and the phase propagates backwards relative to the Kelvin wave.

Tidal Current

M_2 Tidal Current

The M_2 tidal current is the strongest tidal constituent, and generally accounts for more than 80 percent of the total tidal variance represented by the five tidal constituents analyzed. The magnitude of the surface current is greater than 60 cm/s over the shallow areas of Nantucket Shoals, on Georges Bank, south of the tip of Nova Scotia, and in the Bay of Fundy (plate 9). The largest tidal currents (in excess of 100 cm/s) are found on the Northeast Peak of Georges Bank and in the Bay of Fundy, corresponding to a tidal excursion in excess of 14 km. The speed contours shown in the Gulf of Maine are based on only three stations in the northwest corner of the Gulf and a few along the northern edge of Georges Bank; the contours were drawn assuming that speeds are inversely proportional to water depth and, thus, decrease rapidly northward from the shallow water on the crest of Georges Bank to the deeper water of the Gulf of Maine. A small, mid-shelf maximum of the M_2 surface current occurs in the Middle Atlantic Bight, where UMAJOR is slightly greater than 15 cm/s.

The observed maximum cross-shelf tidal current in the region from Long Island southwestward to Cape Hatteras (plate 9) agrees well with the predictions by Redfield (1958) based on the simple canal theory of Sterneck (1915). Battisti and Clarke (1982a) have used a barotropic tidal model which includes rotation and friction to predict the cross-shelf and along-shelf tidal currents. The model results agree with available observations across the shelf southwest of Hudson Canyon and with the few near-shore observations that were used by Battisti and Clarke (1982b) south of Long Island. Brown (1984) has compared the tidal dynamics of the New England Shelf with those of Georges Bank and the Gulf of Maine and found that tidal differences are a result of different balances between the inertial force, coriolis force, and the pressure gradient in the along-isobath and cross-isobath directions.

The amplitude of the M_2 surface current along the shelf between the 60- and 100-m isobath from Northeast Channel southwestward into the Middle Atlantic Bight is shown in figure 3. The rapid decrease in tidal current speed just west of Nantucket Shoals may be responsible for the deposit of fine-grained sediment on the mid-shelf between 70°00′ and 71°30′W. (Bothner and others, 1981; Twichell and others, 1981). This region of weak tidal currents and mixing coincides with the location of the coldest bottom water found on the mid- and outer Continental Shelf in late spring (Houghton and others, 1982).

The orientation of the M_2 ellipse is approximately perpendicular to the local isobaths (plates 9, 10) in the Middle Atlantic Bight, the Gulf of Maine, Georges Bank, and on the Scotian Shelf. However, in the Northeast Channel and the Great South Channel and across Nantucket Shoals and a region southwest of Nova Scotia, the major axis of the tidal ellipse is approximately parallel to the local isobaths. Near the bottom the ellipse orientation is generally rotated slightly clockwise (5°–7°) and the time of maximum speed is usually slightly earlier than at mid-depth (see stations A, K, Q, and MB in table 5, as examples). The amplitude of the major axis of the tidal currents (UMAJOR) decreases with depth but the ratio UMAJOR/UMINOR generally increases toward the bottom. The eccentricity ($e=(1-(\text{UMINOR/UMAJOR})^2)^{1/2}$) of the tidal ellipses varies from 0.99 in regions with strong gradients of surface elevation (southern tip of Nova Scotia, Bay of Fundy, and east of Cape Cod at long 70°00′W. and lat 41°30′N.) to more nearly circular (0.54) in a region (long 71°30′W.) where the gradient of the M_2 elevation is a minimum.

The M_2 tidal current rotates clockwise at 86 percent of the 301 instrument locations. Most of the stations at which the M_2 tidal current rotated counterclockwise at all depths of observation are in the Gulf of Maine and Bay

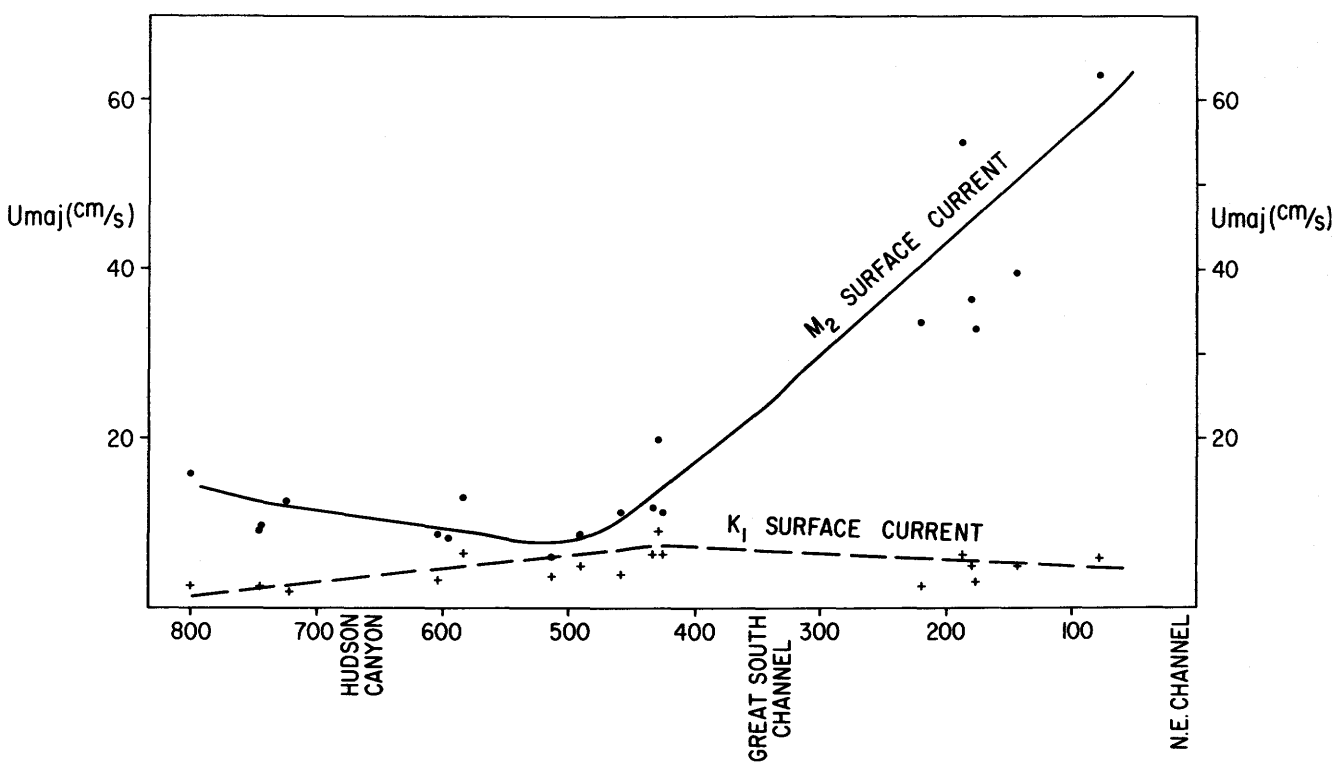

Figure 3. Longshelf variation in UMAJOR for the M_2 and K_1 constituents at stations located between the 60- and 100-m isobath from the Northeast Channel southward to station MB in the Middle Atlantic Bight.

of Fundy with one (LTM) in Hudson Canyon. The tide at a few stations on the Scotian Shelf (S3, SS4, S8, SS12, C1, and C5), two stations in Lydonia Canyon (LCE and LCF), and two stations near Hudson Canyon (NJ4 and LT6) rotates clockwise near the surface and counterclockwise near the bottom.

The area of maximum M_2 bottom speed (>40 cm/s) is on the Northeast Peak of Georges Bank (plate 11). The maximum near-bottom speeds of 7–8 cm/s in the Middle Atlantic Bight are in a region just south of Hudson Canyon (plate 11). On the Scotian Shelf, maximum bottom speeds of 8–9 cm/s are found about halfway across the shelf south of Halifax. Minimum bottom speeds of 3–4 cm/s are in the same area as the minimum surface speeds, near lat 72°W. between the 60- and 100-m isobath.

The M_2 tide over the Middle Atlantic and Scotian Shelf co-oscillates with the tide at the shelf break. This response is characterized by maximum off-shelf tidal current that occurs after maximum tidal elevation by about 90° or 3 hours (plate 12), and by tidal elevation and current amplitude that are approximately uniform across the shelf. The M_2 tide on the southern flank of Georges Bank and Nantucket Shoals is a forced progressive wave. This response is characterized by a maximum northward flow into the Gulf of Maine, which is in phase with maximum elevation (plate 12). The tide in the Gulf of Maine is a forced standing wave with a 90° phase difference between high water and maximum current.

The variability in amplitude and phase of the tidal currents is larger on the Continental Slope than on the Continental Shelf. Observations at three stations across the southern flank of Georges Bank clearly show the increase in variability toward deep water. At station A on the southern flank in water 85 m deep, the standard deviation of the phase was 2°–3°; at station LCM in 120 m of water, the standard deviation of the phase was 7°–10°; and at LCI on the slope in 250 m of water, the phase varied by 30°–49°. A similar large phase uncertainty occurred at station MF (16°–38°) on the Continental Slope in the Middle Atlantic Bight. There are also large phase differences between the surface and bottom currents on the Continental Slope at stations LCI (92°), LCJ (198°), LCK (139°), and MF (95°). These differences are probably due to the presence of significant baroclinic tides which are not found at shallow depths.

Several investigators have specifically analyzed their data for the baroclinic tide. At station SS4 in water 1,020 m deep on the Scotian Slope, the phase ranged from 2° to 3° at the surface to 21° to 87° at depths of 500 to 990 m. The M_2 tidal constants (table 5) for the slope stations SS1A, SS2A, SS4, SS5 and SS8 are almost identical to the baroclinic tidal constants reported by Petrie (1975). Petrie (1975) found that the baroclinic tide was the major tidal component on the Scotian Slope; the tide appeared to be generated at a depth of approximately 200 m but was not observed within about 10 km of the shelf break. On the steep north flank of Georges Bank (station M1), Magnell (1980) found weak and variable tidal currents at mid-depth (77 m; see table 5) and stronger currents at deeper depths (192 m). He interpreted these observations as a baroclinic tide with a velocity node at about 80 m.

M_2 Time Sequence

The sea-surface elevation and the tidal currents for the M_2 lunar tide are shown in plates 13a–f at 2-hour intervals. High water occurs nearly simultaneously across the Middle Atlantic Bight at 0^{hr} Greenwich. At this time the current is weak and flows in the along-shelf direction toward the northeast (plate 13a). There is a strong flow across Georges Bank towards a sea-surface depression (−40 cm) near Boston and into a second depression (−60 cm) at the head of the Bay of Fundy.

After two hours, the sea-surface slopes down from the head of the Bay of Fundy across the Gulf of Maine and Georges Bank (plate 13b). However, flow is still into the Gulf of Maine and the Bay of Fundy and the sea surface continues to rise. The current on the Middle Atlantic and Scotian Shelves is then offshore, and sea level has fallen about 20 to 30 cm since 0^{hr} Greenwich.

High water in the Bay of Fundy occurs just after 3^{hr} Greenwich and just before 4^{hr} Greenwich at Boston. At 4^{hr} Greenwich the current is weak in the western Gulf of Maine, just beginning to flow out of the Bay of Fundy and generally parallel to the local isobaths over Georges Bank (plate 13c). Flow continues to be offshore in the Middle Atlantic Bight and on the Scotian Shelf.

Low water (about −60 cm) occurs on the Middle Atlantic and Scotian Shelves at 6^{hr} Greenwich (plate 13d). The current flow along the shelf towards the southwest. Currents out of the Bay of Fundy and southward across Georges Bank reach a maximum at 6^{hr} Greenwich approximately three hours after high water in the Gulf of Maine.

A large northward slope in the sea surface develops in the Gulf of Maine region at 8^{hr} Greenwich (plate 13e) as water continues to flow out of the Bay of Fundy and off the shelf. In the Middle Atlantic Bight and Scotian Shelf, the water is beginning to flow onshore and fill the depression left by low water two hours earlier.

Maximum sea-surface slope within the Gulf of Maine region occurs between 9^{hr} and 10^{hr} Greenwich, and at 10^{hr} the elevation drops more than 4 m from 15–17 cm on the southern flank of Georges Bank to −410 cm at the head of the Bay of Fundy. The currents are at the minimum amplitude on Georges Bank and oriented southwestward. The currents in the Middle Atlantic Bight and on the Scotian Shelf are onshore and reach a maximum at about 10^{hr} Greenwich (plate 13f).

N_2 Tidal Current

The ratio of the N_2 UMAJOR amplitude to the M_2 UMAJOR amplitude ranged from 0.20 to 0.30. Because the N_2/M_2 ratio is nearly constant over most of the region, the pattern of the N_2 surface current (plate 14) is almost identical to the pattern of the M_2 surface current (plate 9) with approximately one-fourth the amplitude.

The N_2 and M_2 constituents combine to produce a monthly (661.6-hour) modulation of the tidal current. This modulation is about 39 percent larger than the spring-neap modulation (see below) but has basically the same regional variation as that of the spring-neap variation shown in plate 16.

S_2 Tidal Current

The S_2 surface current is similar to the M_2 surface current pattern but the magnitude of the S_2 current is about 20 percent of the M_2 current (plate 15). The S_2 surface current is greater than 10 cm/s on Georges Bank and in the Bay of Fundy and is 2–4 cm/s in the Middle Atlantic Bight, in the Gulf of Maine, and on the Scotian Shelf. Like the M_2 currents, the major axis of the S_2 tidal-current ellipse is generally oriented perpendicular to the local isobaths, except south of Nantucket Shoals where the major axis of the ellipse is parallel to the local isobaths.

The solar S_2 tide combines with the lunar M_2 tide to produce a spring-neap cycle with a period of 354.6 hours. The amplitude of the spring-neap current modulation is typically 15 to 20 percent of the M_2 amplitude (plate 16). The modulation amplitude is largest (30–40 percent of M_2) along the shelf break where the M_2 current speed is small and is nearly constant (15–20 percent) in a band midway across most of the shelf and into the Bay of Fundy. The modulation amplitude is a minimum in the area of strong M_2 currents just east of Cape Cod (long 71°00′W., lat 41°30′N.).

K_1 Tidal Current

The magnitude of the K_1 surface current is a maximum of 10 cm/s over the area adjacent to Nantucket Shoals (long 69°–70°W., plate 17). A secondary maximum of 8 cm/s occurs just south of the tip of Nova Scotia (approximately long 66°W.). Note that the 4 and 6 cm/s contours in plate 17 are drawn showing two distinct maxima separated by the Northeast Channel. The two maxima are separated by observations at three stations in the Northeast Channel made at depths greater than 100 m below the surface (although only one of these stations is shown in plate 17). The magnitude of the K_1 surface current is nearly constant (2 cm/s) across most of the shelf southwest of Hudson Canyon and the lowest values (< 1.0 cm/s) are in the Gulf of Maine. No current observations were made around Sable Island, and thus no data are available to define the current associated with the strong amphidromic point observed for the K_1 tidal elevation in this region. There is a suggestion of three amphidromic points where successive cophase lines radiate from a central area. One point is near the southern tip of Nova Scotia, one point is off Nantucket Island (long 70°W.), and one is near Atlantic City, N.J.

The K_1 tidal current rotates clockwise at 79 percent of the 266 instrument locations (plate 18, table 8). Like that of the M_2, counterclockwise rotation of the K_1 tidal current is observed mostly at stations in the Gulf of Maine and the Bay of Fundy. At several stations on the Scotian Shelf and near Lydonia Canyon the K_1 tide also rotates clockwise at the surface and counterclockwise near the bottom. The K_1 tidal ellipses are oriented generally parallel to the isobaths on the Continental Shelf and nearly perpendicular to the isobaths in deeper water on the slope off Atlantic City, N.J., near Lydonia Canyon, and south of Halifax, Nova Scotia (plate 18). The K_1 tidal ellipses south of Halifax are nearly linear with eccentricities of 0.90 to 0.99.

The uncertainty in the amplitude, orientation, and phase is large (32°–36°) for the K_1 tide, and thus no significant relationship between these ellipse parameters and depth can be determined. The magnitude of the axis of the current ellipse generally decreases with depth; most exceptions are not significant due to the large uncertainty in the K_1 tidal current.

The K_1 tidal elevation leads the current by 60°–120° over the entire Continental Shelf from Cape Hatteras to Sable Island (plate 19). The phase difference does not vary significantly from 90°, given the relatively large variability ($\pm 36°$) in the phase of the K_1 current (table 2).

The variation and magnitude (4–7 cm/s) of the K_1 tidal-current velocities over the Scotian Shelf south of Halifax are the same order of magnitude as the diurnal shelf-wave velocities of 6–10 cm/s computed by Cartwright and others (1980) for the west coast of Scotland, and velocities of 10–13 cm/s predicted by Crawford and Thomson (1982) for the west coast of Vancouver Island. Although shelf waves are sensitive to forcing and to specific shelf topography, these similar current speeds suggest that the K_1 tidal current on the Scotian Shelf might be modeled as a shelf-wave. This suggestive shelf wave character for the K_1 currents on the Scotian Shelf has been modeled in more detail by Daifuku and Beardsley (1983) for the Middle Atlantic Bight.

O_1 Tidal Current

The amplitude of the O_1 surface current is about 72 percent of the amplitude of the K_1 surface current for the

observations on the Scotian Shelf, Georges Bank, and in the Gulf of Maine (plate 20). This is essentially identical to the amplitude ratio (O_1/K_1) for the equilibrium tide (0.71). In contrast, the amplitude of the O_1 surface current in the region from Nantucket Shoals to Cape Hatteras is about 90 percent of the K_1 surface current although there was more variability (±46 percent compared to ±26 percent on the Scotian Shelf, Georges Bank and Gulf of Maine). The magnitude of the O_1 surface current has the same general spatial pattern as the K_1 surface current. There are two current maxima of 6 cm/s, one centered over Nantucket Shoals (~long 71°W.) and one south of Yarmouth, Nova Scotia (~long 65°W.). Over Georges Bank, between these two maxima, is a region of reduced current amplitude and increased ellipse eccentricity. Over the remainder of the shelf, southwest of Nantucket Shoals, the magnitude of the O_1 surface current was nearly constant (~2 cm/s).

The along-shelf and cross-shelf variation of the O_1 current across the Scotian Shelf south of Halifax is similar to the K_1 currents although reduced in amplitude, and suggests a diurnal shelf wave propagating southwestward. The phase over Georges Bank suggests a progressive wave travelling across the bank into the Gulf of Maine. The rotation and orientation of the O_1 ellipses is nearly the same as that described for the K_1 current (plate 21). The eccentricity of the O_1 ellipses was generally about 6 percent greater than that of the K_1 ellipses.

SUMMARY

The five constituents (M_2, N_2, S_2, K_1, and O_1) account for more than 80 percent of the total variance of currents in the Georges Bank region, 30 to 40 percent in the Middle Atlantic Bight, and about 5 percent over the Continental Slope. These five constituents also account for more than 93 percent of the variance in tidal elevation which occurs at periods between 2 and 33 hours.

Semidiurnal tides characterize the water over the Continental Shelf from Cape Hatteras to Laurentian Channel, and mixed but predominantly semidiurnal tides are typical over the Continental Slope. The Gulf of Maine and Bay of Fundy system is near resonance with the frequency of the M_2 (12.42 hr) tidal forcing which causes large tidal elevations of 100 to 400 cm and large tidal currents of 70 to 100 cm/s in the Bay of Fundy. Large M_2 tidal currents of 70 to 100 cm/s also occur over Nantucket Shoals, Georges Bank, and Browns Bank along the seaward entrance to the Gulf of Maine. The semidiurnal tide elevation, however, is a minimum of 30 to 40 cm over most of this same region, which is a transition zone between an incident progressive, ocean wave and a standing wave in the Gulf of Maine. The Middle Atlantic and Scotian Shelves are outside the influence of the resonant Gulf of Maine system and are in cooscillation with the ocean tide. The M_2 tidal elevation amplitude is 50 to 60 cm over the shelf and the tidal currents are 10 to 15 cm/s.

Observations at five stations on the Continental Shelf were used to construct an empirical curve which shows that the M_2 tidal current at 1 mab is approximately 50 percent of the midwater current amplitudes.

The S_2 (12.00 hr) and N_2 (12.66 hr) tidal elevations and currents are about 20 and 25 percent, respectively, of the corresponding M_2 values over the entire Continental Shelf.

The diurnal tides, K_1 (23.93 hr) and O_1 (25.82 hr), have distinct amphidromic points near Sable Island, less distinct amphidromes in the Middle Atlantic Bight, and seem to be a complex combination of Kelvin and shelf waves. Tidal elevation amplitudes for both diurnal constituents range between 3 and 15 cm over the Continental Shelf. The diurnal tidal currents vary between 1 and 10 cm/s with the largest currents in the vicinity of Nantucket Shoals and Browns Bank.

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TABLES 3–9

Table 3. Data references. Alphabetical listing of stations where tidal constants for current and/or elevation are tabulated, the region of the study area in which the station was located, the type of instrument used to make the current or pressure measurement, the method of data analysis, and the data source. The regions and station locations are shown in plate 1. The tidal data are grouped by region in tables 4 through 9. The region code is: SS, Scotian Shelf; GOM, Gulf of Maine; BF, Bay of Fundy; NEC, Northeast Channel; GB, Georges Bank; LC, Lydonia Canyon; GSC, Great South Channel; NS, Nantucket Shoals; NES, New England Shelf; MAB, Middle Atlantic Bight; SMAB, southern Mid-Atlantic Bight; and O, Oceanic. The type of instruments used to make the current or pressure observations are briefly described in Appendix I. The method of analysis (harmonic = H and response = R) is described in the text; p means pressure, c means current. The data source lists either a literature citation or an author of this atlas. If two station names have been used in the literature, the second name is listed in parentheses in the column labeled "source".

Table 3. DATA REFERENCES

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
A	GB	Paroscientific	VACM, USGS tripod	H	Moody and Butman, 1980; Moody and Butman
AMBROSE	MAB	Fisher-Porter	---	H	Goodrich, 1981
ATLANTIC CITY	MAB	Fisher-Porter	---	H	National Ocean Service
B	GSC	Paroscientific	VACM	H	Moody and Butman, 1980; Moody and Butman
				H (p)	Brown and Irish
BANQUEREAU BANK	SS	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.22)
BAR HARBOR	GOM	Fisher-Porter	---	H	National Ocean Service
BARNEGAT L.S.	MAB	---	current pole	H	Haight, 1942
BATTERY	MAB	Fisher-Porter	---	H	National Ocean Service
BBA	NES	Paroscientific	---	H	Moody and Butman
BED60	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BED61	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BED62	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BED63	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BED64	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BED65	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BED66	BF	---	photographic	H	Canadian Hydrographic Service, 1966
BOSTON	GOM	Fisher-Porter	---	H	National Ocean Service
BOSTON L.S.	GOM	---	current pole	H	Haight, 1942
BREAKWATER	MAB	Fisher-Porter	---	H	National Ocean Service
BRENTON REEF	NES	---	current pole	H	Haight, 1942
B1	SS	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.24)
				H	Brown and Irish
B6	GOM	NA	---	H	Cartwright and others, 1979 (station 1.2.27)
		---	---	H	Brown and Irish
C	GB	---	VACM	H	Moody and Butman, 1980; Moody and Butman
CANSO HBR	SS	Ottboro	---	H	Canadian Hydrographic Service, 1969a
CAPE COD CANAL	GOM	Fisher-Porter	---	H	National Ocean Service
CAPE COD LT.	GOM	NA	---	NA	Greenberg, 1975
CAPE HATTERAS	MAB	Fisher-Porter	---	H	National Ocean Service
CAPE MAY	MAB	Fisher-Porter	---	H	National Ocean Service
CASHES LEDGE	GOM	Draper	33m-VACM	R (p)	Vermersch and others, 1979
			68m-EG&G 102	R (c)	Daifuku, 1981 (station GOM2)
			108m-EG&G 102		
CENTREVILLE	BF	Ottboro	---	H	Canadian Hydrographic Service, 1966
CHESAPEAKE	MAB	---	current pole	H	Haight, 1942
CMICE	MAB	---	VACM	R	Daifuku, 1981; May, 1979
C. PORPOISE	GOM	Draper	VACM	R (p)	Vermersch and others, 1979
				R (c)	Daifuku, 1981 (station GOM3)
CXL	NES	Vibratron	---	R	Petrillo, 1981

Table 3. Data references—Continued

Table 3. DATA REFERENCE--continued

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
C1	GOM	---	Aanderaa	R	Daifuku, 1981; Smith
C3	GOM	---	Aanderaa	R	Daifuku, 1981; Smith
C5	GOM	---	Aanderaa	R	Daifuku, 1981; Smith
D	GB	Paroscientific	VACM	H	Moody and Butman, 1980; Moody and Butman
				H (p)	EG&G, 1980; Brown and Irish
DIAMOND	MAB	---	current pole	H	Haight, 1942
DIPPER HBR.	BF	Ottboro	---	H	Canadian Hydrographic Service, 1966
E	NEC	Paroscientific	---	H	Moody and Butman, 1980
				H	Brown and Irish
EASTPORT, ME	BF	Fisher-Porter	---	H	National Ocean Service
EPA1	MAB	NA	---	H	Goodrich, 1981
FIRE IS. L.S.	MAB	---	current pole	H	Haight, 1942
GOBI IV	O	Vibratron	---	H	Cartwright and others, 1979 (station 1.2.19)
GREAT ROUND L.S.	NS	---	current pole	H	Haight, 1942
GSC1	GSC	---	VACM	R	Daifuku, 1980
GSC2	GSC	---	VACM	R	Daifuku, 1981
				R	Daifuku, 1981
HALIFAX	SS	Stilling well	---	H	Canadian Hydrographic Service, 1969a
HENS & CHICKS L.S.	NES	---	current pole	H	Haight, 1942
I	NS	---	EG&G 850	H	Moody and Butman, 1980; Moody and Butman
IAPSO.23	SS	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.23)
ISLE HAUTE, NS	BF	Ottboro	---	H	Canadian Hydrographic Service, 1966
K	GB	Paroscientific	VACM, USGS tripod	H	Moody and Butman, 1980; Moody and Butman
KELVIN	NES	Paroscientific	VACM	H (p)	Brown and Irish
		---	---	R (c)	Daifuku, 1981; Beardsley
KIWI	GSC	Paroscientific	---	H	Brown and Irish
L	GB	---	VACM	H	Moody and Butman, 1980; Moody and Butman
LCA	LC	Paroscientific	VACM, USGS tripod	H	Moody and Butman
LCB	LC	---	VACM	H	Moody and Butman
LCC	LC	---	VACM	H	Moody and Butman
LCD	LC	---	VACM	H	Moody and Butman
LCE	LC	---	VACM	H	Moody and Butman
LCF	LC	---	VACM	H	Moody and Butman
LCG	LC	---	VACM	H	Moody and Butman

Table 3. Data references—Continued

Table 3. DATA REFERENCES--continued

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
LCH	LC	---	VACM	H	Moody and Butman
LCI	LC	---	VACM	H	Moody and Butman
LCJ	LC	---	VACM	H	Moody and Butman
LCK	LC	---	VACM	H	Moody and Butman
LCL	LC	Paroscientific	VACM	H	Moody and Butman
LCM	LC	Paroscientific	VACM, USGS tripod	H	Moody and Butman
LCN	LC	---	VACM	H	Moody and Butman
LCO	LC	Paroscientific	---	H	Moody and Butman
L. EGG	MAB	bubbler	EG&G 102	H	EG&G, 1976
LI1	MAB	---	Aanderaa	R	Mayer, 1982b
LI2	MAB	---	Aanderaa on spar	R	Mayer, 1982b
LI3	MAB	---	Aanderaa on spar	R	Mayer, 1982b
LI4	MAB	---	Aanderaa	R	Mayer, 1982b
LOCKPORT	SS	Ottboro	---	H	Canadian Hydrographic Service, 1969a
LOUISBERG	SS	Ottboro	---	H	Canadian Hydrographic Service, 1969
LTM	MAB	Paroscientific	Aanderaa	R (p)	Mofjeld; Goodrich
				H (p)	Brown and Irish
				R (c)	Mayer and others, 1979
LT2	MAB	Paroscientific	3-m Aanderaa on spar	R (p)	Mofjeld; Brown and Irish
			15, 23-m Aanderaa	H (c)	National Ocean Service
				R (c)	Mayer, 1982b
LT3	MAB	---	Aanderaa	R	Daifuku, 1981 (station MESA3)
LT4	MAB	Paroscientific	3-m Aanderaa on spar	R (p)	Mofjeld; Goodrich
			24, 44, 51-m Aanderaa	H (p)	Brown and Irish
				H (c)	National Ocean Service
LT5	MAB	Paroscientific	Aanderaa	R (p)	Mofjeld; Goodrich, 1981
				H (p)	Brown and Irish
				H (c)	National Ocean Service
				R (c)	Daifuku, 1981 (station MESA5)
LT6	MAB	---	3-m Aanderaa on spar	R	Mayer, 1982b
			62-m Aanderaa		
LT7	MAB	---	Aanderaa	R	Mayer, 1982b
M	GSC	---	VACM	H	Moody and Butman, 1980; Moody and Butman;
				R	Daifuku, 1981 (station GSC3)
MA	MAB	Paroscientific	USGS tripod	H	Moody and Butman, 1980; Moody and Butman
MAB	MAB	---	9-m Endeco(modif.)	R	Daifuku, 1981; Boicourt
			21,32-m Aanderaa		
MARGARETVILLE	BF	Ottboro	---	H	Canadian Hydrographic Service, 1966
MB	MAB	Paroscientific	VACM, USGS tripod	H	Moody and Butman, 1980; Moody and Butman
MC	MAB	Paroscientific	USGS tripod	H	Moody and Butman, 1980; Moody and Butman
MD	MAB	Paroscientific	USGS tripod	H	Moody and Butman, 1980; Moody and Butman
ME	MAB	Paroscientific	USGS tripod	H	Moody and Butman
MENEMSHA	NES	bubbler	---	H	Moody and Redfield, 1977; Moody
MESA	MAB	Filloux	---	H	Cartwright and others, 1979 (station 1.2.17); Mofjeld
MESA7	MAB	---	Aanderaa	R	Daifuku, 1981
MESA9	MAB	Filloux		R	Beardsley and others, 1977; Goodrich, 1981
MESA10	MAB	Vibratron	---	R	Beardsley and others, 1977; Goodrich, 1981
MESA11	MAB	Vibratron	---	R	Beardsley and others, 1977; Goodrich, 1981

Table 3. Data references—Continued

Table 3. DATA REFERENCES--continued

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
MF	MAB	---	VACM	H	Moody and Butman
MIT/WHOI3	NES	Draper	---	R	Beardsley and others, 1977
MONHEGAN	GOM	Draper	33m-VACM	R	Vermersch and others, 1979
			68m-EG&G 102		Daifuku, 1981 (station GOM1)
MONTAUK	MAB	Vibratron	---	R	Goodrich, 1981; Petrillo, 1981
M1	GB	Aanderaa TG-4A	77m-EG&G 102	R	EG&G, 1980; Brown and Irish
			192m-Aanderaa	R	EG&G, 1979; Magnell, 1980
M2	GB	Aanderaa TG-4A	EG&G 102	H (p)	EG&G, 1980; Brown and Irish
				R (c)	EG&G, 1979; Magnell, 1980
M3	GB	Aanderaa TG-4A	VACM	H	EG&G, 1979, 1980; Brown and Irish
M4	GB	Aanderaa TG-4A	10m-VACM	H	EG&G, 1979, 1980; Brown and Irish
			36m-EG&G 102		
			69m-EG&G 102		
M5	GB	Aanderaa TG-4A	---	H	EG&G, 1979, 1980; Brown and Irish
M7	GB	Aanderaa TG-4A	---	H	EG&G, 1979, 1980; Brown and Irish
M9	GB	Aanderaa TG-4A	RAY	H	EG&G, 1979, 1980; Brown and Irish
N	GSC	---	VACM	H	Moody and Butman
NANTUCKET L.S.	NS	---	current pole	H	Haight, 1942
NAUSET	GOM	Paroscientific	---	H	Aubrey and others, 1981; Moody and Butman
NE END L.S.	MAB	---	current pole	H	Haight, 1942
NEC1	NEC	---	VACM	H	Moody; Wright and Ramp
NEC2	NEC	---	VACM	H	Moody; Wright and Ramp
NEC3	NEC	---	VACM	H	Moody; Wright and Ramp
NES741	NES	---	VACM	R	Daifuku, 1981; Beardsley
NES742	NES	---	20m-VACM	R	Daifuku, 1981; Beardsley
NES743	NES	---	20m-VACM	R	Daifuku, 1981; Beardsley
NES762	NES	---	VACM	R	Daifuku, 1981; Beardsley
NES762W	MAB	---	VACM	R	Daifuku, 1981; Beardsley
NES763	NES	Paroscientific	VACM	H (p)	Brown and Irish (station KELVIN)
				R (c)	Daifuku, 1981; Beardsley
NES763W	MAB	---	VACM	R	Daifuku, 1981; Beardsley
NES764	NES	---	VACM	R	Daifuku, 1981; Beardsley
NES765	O	---	VACM	R	Daifuku, 1981; Beardsley
Newport	NES	Fisher-Porter	---	H	National Ocean Service
NJ2	MAB	---	Aanderaa on spar	R	Mayer, 1982b
NJ3	MAB	---	Aanderaa	R	Mayer, 1982b
NJ4	MAB	---	Aanderaa	R	Daifuku, 1981 (station MESA4)
NOAA	O	Filloux	---	H	Cartwright and others, 1979 (station 1.2.16); Mofjeld
NSA	NS	---	Endeco	R	Daifuku, 1981; Beardsley
NSB	NS	---	Endeco	R	Daifuku, 1981; Beardsley
NSC	NS	---	Endeco	R	Daifuku, 1981; Beardsley
NSD	NS	---	Endeco	R	Daifuku, 1981; Beardsley
NSE	NS	---	Endeco	R	Daifuku, 1981; Beardsley

Table 3. DATA REFERENCES--continued

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
NSFE1	NS	Paroscientific	VACM	H (p)	Brown and Irish
				R (c)	Daifuku, 1981
NSFE2	NS	Paroscientific	VACM	H (p)	Brown and Irish
				R (c)	Daifuku, 1981
NSFE3	NS	---	VACM	R	Daifuku, 1981; Beardsley
NSFE4	NS	Paroscientific	VACM	H (p)	Brown and Irish
				R (c)	Daifuku, 1981
NSFE5	NS	Paroscientific	VACM	H (p)	Brown and Irish
				R (c)	Daifuku, 1981
NSFE6	NS	---	VACM	R	Daifuku, 1981; Beardsley
OCEAN CITY, MD	MAB	Fisher-Porter	---	H	National Ocean Service
P	NES	Paroscientific	VACM, USGS tripod	H	Moody and Butman, 1980; Moody and Butman
PICKET	NES	Paroscientific	---	H	Brown and Irish
PINKNEY PT.	GOM	Ottboro	---	H	Canadian Hydrographic Service, 1969a
POLLOCK L.S.	NS	---	current pole	H	Haight, 1942
PORTLAND, ME	GOM	Fisher-Porter	---	H	National Ocean Service
PORT MAITLAND	GOM	Ottboro	---	H	Canadian Hydrographic Service, 1969a
PORTSMOUTH, NH	GOM	Fisher-Porter	---	H	National Ocean Service
P1	GB	---	Aanderaa	H	Moody; Ramp, Wright, Allen
P2	GB	---	VACM 30m-Aanderaa	H	Moody; Ramp, Wright, Allen
P3	GB	---	Aanderaa	H	Moody; Ramp, Wright, Allen
P4	GB	---	VACM	H	Moody; Ramp, Wright, Allen
P5	GB	---	VACM	H	Moody; Ramp, Wright, Allen
P6	GB	---	VACM	H	Moody; Ramp, Wright, Allen
P11	MAB	---	Aanderaa	R	Mayer
P12	MAB	---	Aanderaa	R	Mayer
P22	MAB	Paroscientific	---	H	Mofjeld; Goodrich, 1981
P31	MAB	Paroscientific	Aanderaa	R (p)	Mofjeld; Goodrich, 1981
				R (c)	Mayer
P32	MAB	Paroscientific	NA	R (p)	Mofjeld
				R (c)	Mayer
Q	NS	Paroscientific	VACM, USGS tripod	H	Moody and Butman, 1980; Moody and Butman
R	GSC	Paroscientific	VACM	H	Moody and Butman, 1980; Moody and Butman
ROCKLAND, ME	GOM	Fisher-Porter	---	H	National Ocean Service
REIKO-MAY	O	Hewlett-Packard	---	R	Brown and others, 1975; Zetler and others, 1975
S	NS	Paroscientific	---	H	Moody and Butman
SABLE IS.	SS	Ottboro	---	H	Canadian Hydrographic Service, 1969a
SANDY HOOK	MAB	Fisher-Porter	---	H	National Ocean Service
SEAL IS.	GOM	Ottboro	---	H	Canadian Hydrographic Service, 1969a
SHINNECOCK	MAB	bubbler	---	H	National Ocean Service; Goodrich, 1981

Table 3. DATA REFERENCES--continued

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
SITE D	O	---	EG&G 850	R	Regal and Wunsch, 1973
ST. MARTINS	BF	Ottboro	---	H	Canadian Hydrographic Service, 1966
ST. PAUL IS.	SS	Ottboro	---	H	Canadian Hydrographic Service, 1969a
SS1	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS1A	SS	---	Aanderaa	H	Petrie, 1974; Petrie and Smith
SS2	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS2A	SS	---	Aanderaa	H	Petrie, 1974; Petrie and Smith
SS3	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS4	SS	---	Aanderaa 500m-Braincon	H	Petrie, 1974; Petrie and Smith
SS5	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS6	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS7	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS8	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS10	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS12	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
SS13	SS	---	Braincon	H	Petrie, 1974; Petrie and Smith
S1	SS	---	Aanderaa 20m-Braincon	H	Petrie and Smith
S2	SS	---	Aanderaa 30m-Braincon	H	Petrie and Smith
S3	SS	---	Aanderaa 500m-Braincon	H	Petrie and Smith
S5	SS	---	Aanderaa	H	Petrie and Smith
S6	SS	---	Aanderaa 20m-Braincon	H	Petrie and Smith
S7	SS	---	Aanderaa	H	Petrie and Smith
S8	O	---	Aanderaa	H	Petrie and Smith
T3	NEC	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.25);
				H	Garrett, Toulany, 1979; Brown and Irish
T4	GB	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.26)
				H	Garrett, Toulany, 1979; Brown and Irish
T21	SS	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.28);
				H	Garrett, Toulany, 1979; Brown and Irish
T22A	NEC	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.29);
				H	Garrett, Toulany, 1979; Brown and Irish

Table 3. DATA REFERENCES--continued

Station	Region	Instrument Type: Pressure	Instrument Type: Current	Analysis	Source
T22B	NEC	Aanderaa	---	H	Cartwright and others, 1979 (station 1.2.30); Garrett, Toulany, 1969
				H	Brown and Irish
T23	LC	NA	---	H	Cartwright and others, 1979 (station 1.2.31)
				H	Brown and Irish
VINEYARD L.S.	NES	---	current pole	H	Haight, 1942
WALLOPS IS.	MAB	Fisher-Porter	---	H	National Ocean Service
WINTER QUARTER	MAB	---	current pole	H	Haight, 1942
W. NEWDY QUODDY	SS	Ottboro	---	H	Canadian Hydrographic Service, 1969a
YARMOUTH	GOM	Stilling well	---	H	Canadian Hydrographic Service, 1969a
15	MAB	---	Aanderaa on spar	R	Mayer
28	MAB	---	Aanderaa on spar	R	Mayer
30	MAB	---	Aanderaa on spar	R	Mayer
49	MAB	---	Aanderaa on spar	R	Mayer

Table 4. Tidal constants for elevation. The stations are grouped by region (see plate 1), and are listed within each region from east to west. For each station, the latitude and longitude, the record length, the instrument depth, and the amplitude (in cm) and phase (in °Greenwich) for the M_2, N_2, S_2 K_1 and O_1 constituents are tabulated. Where separate analysis was done by two different investigators, both are listed. The (±) number which follows some constants is the standard deviation of the constants computed by the harmonic method for each data piece, or an estimate of the standard error where the constants have been determined by the response method (see Data Analysis for discussion).

Table 4. TIDAL ELEVATIONS

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
SCOTIAN SHELF													
BANQUEREAU* 44°35'N. 57°41'W.	36	64	NA	44.1	345	9.8	320	10.7	23	5.5	162	4.7	166
ST. PAUL 47°12'N. 60°09'W.	730	NA	NA	30.8	366	6.4	343	10.1	47	8.5	295	9.1	266
SABLE IS 43°58'N. 59°48'W.	73	NA	NA	52.4	352	9.1	333	11.6	29	2.7	162	2.7	211
LOUISBERG 45°55'N. 59°58'W.	29	NA	NA	50.3	344	11.0	312	12.0	24	6.1	24	6.1	321
CANSO HBR. 45°20'N. 61°00'W.	15	NA	NA	58.8	347	10.1	345	14.0	20	6.4	48	2.7	335
W. NEWDY 44°54'N. 62°19'W.	29	NA	NA	60.7	347	16.9	328	16.6	26	8.8	95	4.4	57
B1*	63	226	NA	48.2	351	11.9	329	10.3	22	6.9	173	5.7	170
42°49'N. 63°12'W.	62	226	NA	48.3	350	12.5	323	11.0	24	6.7	172	5.4	177
HALIFAX 44°40'N. 63°35'W.	365	NA	NA	63.0	349	14.3	329	14.3	21	10.3	121	4.8	93
IAPSO.23* 42°47'N. 63°59'W.	102	246	NA	49.2	350	10.8	330	11.7	20	6.9	172	5.9	176
T21*	58	232	NA	49.0	357	11.6	335	10.3	23	6.8	170	5.4	179
42°37'N. 64°22'W.	NA	232	NA	48.7	356	13.2	341	10.4	24	6.2	161	5.4	178
LOCKPORT 43°42'N. 65°07'W.	29	NA	NA	69.8	359	17.1	337	13.7	29	12.8	147	7.6	116

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
NORTHEAST CHANNEL													
T22A*	58	256	NA	45.8	4	10.7	343	9.4	28	7.1	167	5.5	179
42°07'N. 65°30'W.	57	256	NA	45.6	4	12.2	347	9.6	30	7.5	179	5.7	182
T22B*	58	242	NA	44.2	9	10.4	346	8.9	31	7.3	169	5.4	179
42°03'N. 65°38'W.	57	242	NA	44.0	9	12.0	351	9.0	33	7.7	181	5.6	182
T3*	84	138	NA	39.6	2	10.3	341	8.2	28	7.1	170	5.8	179
41°44'N. 65°48'W.	84	138	NA	38.6	1	10.0	336	8.7	29	7.1	169	5.7	177
E	145	210	5	45.2+-0.4	24+-2	11.0+-0.7	360+-4	8.8+-0.8	47+-3	8.4+-0.5	172+-2	6.6+-0.5	178+-6
42°14'N. 65°51'W.	160	210	5	45.4	24	11.9	358	9.1	46	8.1	170	6.3	177
GULF OF MAINE													
SEAL IS. 43°29'N. 66°00'W.	73	NA	NA	120.4	52	25.3	24	21.0	86	13.7	179	10.4	163
PINKNEY 43°43'N. 66°04'W.	29	NA	NA	155.4	59	29.9	49	23.5	92	12.2	184	10.4	169
YARMOUTH 43°50'N. 66°07'W.	1476	NA	NA	163.2	63	34.9	33	26.9	97	13.5	182	10.1	164
PORT MAIT. 43°59'N. 66°09'W.	29	NA	NA	185.1	66	38.7	47	29.7	101	15.1	183	11.0	167
B6*	63	190	NA	88.0	87	21.6	57	12.9	119	10.8	196	9.2	181
42°28'N. 67°43'W.	62	190	NA	88.3	87	20.9	57	13.3	119	11.0	195	9.0	180
BAR HBR. 44°24'N. 68°12'W.	369	NA	NA	154.9	93	35.6	60	25.3	127	14.0	196	11.0	174
CASHES LDG* 43°11'N. 69°05'W.	57	189	1	120.0	98	28.2	66	19.5	126	12.5	198	10.1	186

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
GULF OF MAINE--CONT.													
ROCKLAND 44°06'N. 69°06'W.	29	NA	NA	150.0	98	33.0	65	19.5	133	15.2	201	11.8	170
MONHEGAN* 43°40'N. 69°23'W.	56	97	1	130.3+-1.2	99+-1	30.3	67	21.1	128	13.6+-0.9	198+-4	10.3	181
NAUSET* 41°49'N. 69°56'W.	58	7	1	103.2+-0.1	102+-0	22.2+-0.1	70+-3	14.4+-1.3	133+-3	13.1+-0.4	201+-1	11.5+-0.6	182+-1
C.COD LT.** 42°03'N. 70°05'W.	29	NA	NA	116.0	113	NA	NA	NA	NA	NA	NA	NA	NA
PORTLAND 43°39'N. 70°15'W.	1845	NA	NA	133.0	103	29.6	73	21.7	138	13.9	202	11.1	183
C.PORPOISE* 43°13'N. 70°17'W.	73	97	1	127.2+-1.2	103+-1	29.9	71	20.3	134	12.9+-0.9	204+-4	10.6	185
C.COD CANL 41°46'N. 70°30'W.	369	NA	NA	124.4	109	28.9	74	19.9	144	13.1	206	10.8	187
PORTSMOUTH 43°05'N. 70°44'W.	365	NA	NA	130.3	107	27.8	76	20.3	143	14.1	204	11.2	185
BOSTON 42°21'N. 71°03'W.	1845	NA	NA	134.5	111	30.1	82	21.9	146	14.0	207	11.1	189
BAY OF FUNDY													
ISLE HAUTE 45°15'N. 65°01'W.	45	NA	NA	418.8	98	86.6	74	42.4	159	16.5	196	11.9	158
MARGARETVIL 45°03'N. 65°03'W.	58	NA	NA	387.4	92	114.9	63	42.4	146	15.5	188	13.7	171

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
** - location estimated from figure in D. Greenberg's thesis.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
BAY OF FUNDY--CONT.													
ST.MARTINS 45°22'N. 65°32'W.	58	NA	NA	368.5	102	90.5	69	58.5	148	16.2	195	11.9	176
CENTREVILLE 44°34'N. 66°02'W.	87	NA	NA	260.6	92	72.8	67	42.4	137	14.9	189	11.6	171
DIPPER HBR. 45°06'N. 66°26'W.	58	NA	NA	280.4	98	68.6	60	42.1	161	15.8	191	13.1	170
EASTPORT 44°54'N. 66°59'W.	1107	NA	NA	261.3	99	54.3	68	43.5	137	14.7	196	11.4	177
GEORGES BANK													
M7* 41°58'N. 66°20'W.	183	84	1	41.0	38	9.7	12	8.6	59	7.6	182	6.5	178
M5* 40°46'N. 66°49'W.	404	199	1	40.5	356	9.3	337	9.2	24	8.0	171	6.1	178
T4*	36	180	NA	40.4	355	10.5	337	8.4	24	7.7	172	6.0	177
40°44'N. 66°50'W.	34	180	NA	40.5	355	9.8	338	9.0	18	7.7	169	5.8	179
M4* 40°55'N. 66°58'W.	266	84	1	38.9+-0.8	1+-1	10.1+-0.7	349+-4	8.4+-0.7	26+-4	7.5+-0.6	168+-4	5.8+-0.6	185+-6
M3* 41°20'N. 67°15'W.	122	43	1	39.6+-0.8	22+-1	10.0+-0.7	354+-4	9.8+-0.7	15+-5	6.6+-0.7	178+-5	6.6+-0.7	179+-6
M9* 40°51'N. 67°23'W.	316	78	1	38.9+-0.1	6+-1	10.7+-1.0	346+-5	7.9+-0.9	32+-6	7.2+-0.7	170+-5	5.6+-0.7	188+-6
A* 40°51'N. 67°24'W.	406	84	1	38.9+-0.3	5+-1	9.6+-0.4	344+-3	8.7+-0.4	27+-2	7.6+-0.4	173+-2	6.1+-0.3	179+-3

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
** - depths are based on mean pressure
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	,01 AMP (CM)	,01 PHASE (DEG-G)
GEORGES BANK--CONT.													
K* 41°04'N 67°34'W	348	61	1	39.9+-0.5	18+-2	9.9+-0.4	354+-2	8.6+-0.3	38+-4	7.4+-0.4	176+-1	6.2+-0.4	180+-2
D 41°59'N. 67°47'W.	29	83	1	75.8	93	18.6	63	11.1	120	10.2	198	8.5	184
M2* 41°59'N. 67°47'W.	94	83	1	77.2	92	18.3	65	19.0	162	10.7	197	8.8	186
M1* 42°04'N. 67°52'W.	556	179	5	78.2	92	18.0	63	12.2	121	11.2	199	8.5	185
LYDONIA CANYON													
LCL* 40°32'N. 67°36'W.	87	124	1	39.4+-0.1	354+-1	9.1+-0.4	330+-2	9.5+-0.4	19+-1	8.0+-0.3	171+-2	6.1+-0.2	180+-1
LCO* 40°27'N. 67°40'W.	87	549	1	39.2+-0.3	357+-1	9.3+-0.7	333+-3	9.1+-0.3	21+-2	8.4+-0.5	173+-1	6.5+-0.2	179+-3
LCA* 40°34'N. 67°45'W.	58	99	1	39.2+-0.0	358+-2	9.8+-0.3	338+-6	8.8+-0.3	21+-3	7.8+-0.4	169+-1	6.3+-0.1	178+-1
T23* 40°22'N. 67°45'W.	58	173	1	40.7	356	9.9	336	8.6	20	7.9	172	6.1	180
	57	173	1	40.4	356	8.8	341	8.7	22	7.6	162	6.1	183
LCM* 40°30'N. 67°49'W.	174	119	1	39.4+-0.1	356+-1	9.5+-0.5	334+-4	9.2+-0.3	21+-2	8.0+-0.4	172+-2	6.2+-0.2	180+-2
GREAT SOUTH CHANNEL													
B* 40°49'N. 69°00'W.	116	77	1	25.9+-0.0	47+-2	7.5+-0.6	20+-1	5.0+-0.0	59+-3	7.3+-1.0	196+-1	7.5+-1.0	192+-1
	136	77	1	25.9	47	7.1	21	4.8	58	7.0	193	7.4	192
R* 40°30'N. 69°07'W.	16	79	1	31.4+-0.4	3+-1	7.9+-0.3	344+-4	7.6+-0.2	21+-1	7.3+-0.2	178+-5	6.3+-0.2	185+-3
KIWI* 39°55'N. 69°25'W.	78	510	1	41.4	349	11.0	334	8.1	15	8.7	176	6.7	180

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
NANTUCKET SHOALS													
S 41°11'N. 70°12'W.	29	25	0	32.3	1	9.1	339	7.8	21	6.1	177	5.8	197
NSFE1* 40°41'N. 70°08'W.	365	45	1	38.7	356	9.4	340	8.9	18	6.5	173	5.6	190
Q* 40°30'N. 70°13'W.	116	66	1	38.7+-0.2	353+-1	9.3+-0.3	337+-3	8.7+-0.1	18+-3	7.3+-0.4	173+-2	5.9+-0.1	186+-4
NSFE2* 40°29'N. 70°13'W.	58	65	1	40.4	354	9.6	338	8.7	17	7.3	173	5.9	188
NSFE4* 40°13'N. 70°19'W.	374	104	1	42.0	353	9.7	336	9.2	18	8.1	177	6.5	185
NSFE5* 40°02'N. 70°23'W.	365	197	1	41.9	351	10.3	335	9.1	17	8.6	175	6.5	183
NEW ENGLAND SHELF													
P* 40°29'N. 70°30'W.	58	70	1	41.6+-0.4	352+-0	10.3+-0.2	337+-3	9.5+-0.0	15+-1	8.3+-0.5	177+-2	5.9+-0.2	185+-1
BBA* 41°38'N. 70°40'W.	29	13	1	53.8	8	13.8	351	11.6	32	6.6	168	4.9	204
MENEMSHA 41°20'N. 70°46'W.	58	1	0	45.1+-0.6	5+-3	11.9+-0.2	356+-5	10.0+-0.1	24+-4	5.4+-0.5	176+-8	6.0+-0.8	195+-1
MIT/WHOI3 40°18'N. 70°54'W.	22	112	1	42.2+-0.5	347+-1	10.5+-0.1	327+-1	10.1+-0.1	13+-1	8.3+-0.8	173+-5	6.8+-0.6	178+-5
NES763* 39°56'N. 71°03'W.	136	516	1	43.3+-0.5	349+-1	10.4	332	8.9	17	8.7+-0.4	178+-2	6.9	181
CXL 41°09'N. 71°03'W.	35	34	0	44.4	1	10.3	334	9.9	0	6.5	178	5.1	183

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
NEW ENGLAND SHELF--CONT.													
PICKET* 40°43'N. 71°19'W.	79	68	1	44.0+-0.8	349+-1	12.0	317	9.5	0	7.9+-0.5	167+-4	5.3	182
NEWPORT 41°30'N. 71°20'W.	1107	NA	NA	51.3	1	12.4	345	11.9	23	6.2	168	4.9	199
MIDDLE ATLANTIC BIGHT													
P32 40°15'N. 71°52'W.	87	74	1	47.6	348	11.7	332	10.3	16	11.7	163	4.9	188
MONTAUK 41°05'N. 71°49'W.	113	19	0	33.5	11	8.3	358	7.8	35	7.2	164	4.1	192
LT5* 40°12'N. 72°00'W.	183	67	1	46.8+-0.6	349+-1	11.2	331	10.5	15	8.3+-0.3	175+-2	6.0	184
MESA 39°13'N. 72°10'W.	29	840	1	43.6	345	9.1	332	9.5	8	8.5	170	8.1	185
P31 40°39'N. 72°15'W.	87	46	1	49.6	346	12.0	330	10.9	15	10.4	158	4.0	185
LT4* 40°34'N. 72°19'W.	61	50	1	48.2+-1.0	347+-1	11.9	330	11.5	12	8.0+-0.8	166+-5	5.6	180
SHINNECOCK 40°50'N. 72°29'W.	29	NA	NA	46.7	345	11.5	329	9.7	7	5.7	166	2.8	201
ME* 39°57'N. 72°36'W.	29	58	1	48.3+-0.1	347+-0	10.6+-0.5	332+-3	11.0+-0.4	14+-0	9.0+-0.3	172+-3	5.9+-0.8	175+-2
P22 39°39'N. 72°38'W.	30	77	1	47.8	349	11.6	333	10.4	13	8.5	181	6.7	179

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
MIDDLE ATLANTIC BIGHT--CONT.													
MESA9 39°46'N. 72°42'W.	22	56	1	49.8+-0.6	351+-1	11.3+-0.1	330+-1	10.6+-0.1	17+-1	9.5+-0.4	174+-2	6.6+-0.2	181+-2
LTM 40°07'N. 72°55'W.	184	47	1	53.4	348	12.8	331	11.8	14	9.2	169	5.9	174
MA* 39°27'N. 73°00'W.	58	58	1	48.1	348	10.9	333	10.9	13	8.9	175	6.8	179
MESA10* 40°00'N. 73°14'W.	22	45	1	55.5+-2.2	351+-2	12.8+-0.5	332+-2	12.5+-0.5	16+-2	9.8+-1.8	172+-10	6.5+-1.2	170+-10
MC* 38°33'N. 73°31'W.	116	79	1	44.2+-0.5	351+-1	10.3+-0.4	334+-2	9.6+-0.5	17+-1	8.9+-0.4	179+-1	6.9+-0.3	181+-2
MESA11* 40°08'N. 73°34'W.	22	36	1	58.9+-3.0	350+-3	13.8+-0.7	330+-3	13.1+-0.7	15+-3	10.0+-2.3	167+-13	6.3+-1.5	169+-13
MB* 38°44'N. 73°38'W.	406	59	1	46.7+-0.3	350+-1	10.7+-0.6	332+-3	9.7+-0.5	16+-2	9.3+-0.3	179+-3	6.9+-0.3	180+-2
EPA1 39°38'N. 73°42'W.	29	NA	NA	54.8	347	12.4	328	10.8	18	10.3	169	7.2	167
LT2* 39°24'N. 73°44'W.	180	32	1	54.6	353	13.0	335	11.8	19	9.7	177	6.8	172
AMBROSE 40°28'N. 73°50'W.	58	NA	NA	65.0	353	15.6	336	13.5	18	10.3	176	6.3	158
BATTERY 40°42'N. 74°01'W.	1476	NA	NA	64.1	23	14.3	4	13.3	48	9.8	182	5.2	181
SANDYHOOK 40°28'N. 74°01'W.	1107	NA	NA	65.6+-3.5	7+-3	14.4+-0.8	352+-3	13.7+-0.7	34+-3	9.7+-2.8	176+-17	5.2+-1.5	172+-17

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 4. Tidal constants for elevation—Continued

Table 4. TIDAL ELEVATIONS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	M2 AMP (CM)	M2 PHASE (DEG-G)	N2 AMP (CM)	N2 PHASE (DEG-G)	S2 AMP (CM)	S2 PHASE (DEG-G)	K1 AMP (CM)	K1 PHASE (DEG-G)	O1 AMP (CM)	O1 PHASE (DEG-G)
MIDDLE ATLANTIC BIGHT													
MD* 38°59'N. 74°02'W.	116	40	1	52.4+-0.3	354+-1	12.0+-0.7	335+-4	11.1+-0.3	17+-1	10.2+-0.5	182+-2	7.5+-0.6	175+-5
L. EGG 39°28'N. 74°16'W.	203	NA	NA	59.1	358	14.9	338	11.8	25	12.0	176	7.4	163
ATL.CITY 39°21'N. 74°25'W.	369	NA	NA	58.3	354	13.8	335	12.3	18	10.9	180	7.3	167
CAPE MAY 38°58'N. 74°58'W.	365	NA	NA	70.4	30	16.0	14	12.7	56	10.4	200	8.4	188
SOUTHERN MID-ATLANTIC BIGHT													
BREAKWTR. 38°47'N. 75°06'W.	1107	NA	NA	59.1	30	13.0	8	11.2	53	10.3	201	8.4	188
WALLOPS IS 37°50'N. 75°28'W.	29	NA	NA	50.7	355	12.3	334	11.1	17	7.2	170	7.3	198
OCEAN CITY 38°19'N. 75°05'W.	145	NA	NA	49.0	3	12.2	346	9.0	30	7.8	193	8.4	187
C.HATTERAS 35°13'N. 75°38'W.	29	NA	NA	43.9	356	9.8	340	5.3	11	9.2	186	6.5	184
OCEANIC													
REIKO-MAY 27°58'N. 69°40'W.	35	NA	0	34.6	1	8.2	339	6.8	33	7.8	195	6.2	196
NOAA 37°22'N. 73°05'W.	29	2743	NA	43.2	340	9.8	323	8.8	6	8.5	171	7.4	178
GOBI-IV 38°10'N. 71°22'W.	43	2516	NA	44.5	350	11.1	341	9.1	26	6.3	181	9.6	166

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
* - Pressure data was converted to cm using 1 mb=0.995 cm.
NA - not available

Table 5. M_2 tidal current parameters. The stations are grouped by region (see plate 1) and are listed within each region from east to west. For each station, the latitude and longitude, the record length (days), the instrument depth (m), the amplitude (in cm/s) and the phase (in °G) for the east and north current, and the four ellipse parameters (UMAJOR, UMINOR, PHASE, and ORIENTATION) are tabulated. The (±) number which follows some constants is the standard deviation of the estimates computed by the harmonic method for each data piece, or the standard error where the constants have been determined by the response method (see Data analysis for discussion).

Table 5. M2 TIDAL CURRENT PARAMETERS

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF											
SS10	32	200	1400	1.3	178	1.6	68	1.7	-1.1	48	331
43°34'N.	22	500	1100	3.0	65	2.5	320	3.2	-2.3	266	297
59°04'W.	12	1500	100	0.3	329	2.6	194	2.6	-0.2	194	355
SS2A	35	555	245	4.2	192	4.7	126	5.3	-3.4	152	37
42°52'N.											
62°00'W.											
SS8	5	200	1350	5.0	147	3.7	73	5.2	-3.4	133	69
42°37'N.	36	1500	50	2.8	66	2.5	287	3.5	-1.3	264	311
62°05'W.											
SS1A	35	290	260	2.3	329	4.4	208	4.6	-1.9	200	342
42°52'N.	35	490	60	2.9	164	3.5	344	4.5	-0.0	344	320
62°14'W.											
SS3	238	20	79	12.8+-0.8	63+- 8	16.8+-1.4	301+- 7	18.7+-1.5	-9.7+-0.9	283+- 5	329+- 4
43°22'N.	149	50	49	12.6+-1.5	36+- 9	16.7+-1.0	285+- 8	17.8+-1.2	-10.9+-0.8	268+- 12	334+- 9
62°40'W.	47	81	18	7.7	49	12.5	254	14.4	-2.8	247	330
	15	91	8	9.8	70	15.5	307	16.7	-7.6	295	336
	136	95	4	7.9+-0.7	41+- 8	11.5+-1.8	279+- 6	12.5+-1.7	-6.2+-0.4	265+- 7	333+- 5
SS7	27	50	75	9.4	56	13.9	284	15.6	-6.2	271	331
43°02'N.	27	118	7	8.5	61	10.2	289	12.2	-5.3	271	323
62°54'W.											
SS2	189	20	258	5.8+-3.4	151+- 79	2.3+-3.0	231+- 96	5.8+-3.4	-1.4+-3.6	258+- 95	283+- 98
43°45'N.	283	50	228	2.9+-1.5	178+- 35	3.1+-1.6	265+- 35	4.5+-0.8	+0.9+-0.8	289+- 51	328+- 52
62°59'W.	166	95	183	1.8+-0.8	92+- 56	3.8+-1.5	278+- 16	4.2+-1.2	-0.0+-1.3	284+- 29	334+- 19
	272	250	28	5.4+-1.2	56+- 18	7.5+-1.5	289+- 13	8.4+-1.5	-3.9+-1.2	275+- 10	331+- 6
SS6	26	50	85	8.9	72	11.5	298	13.5	-5.5	282	325
43°15'N.	27	130	5	5.6	63	10.9	279	11.9	-3.0	273	336
63°22'W.											
SS1	211	14	87	3.2+-0.6	145+- 69	1.1+-1.5	103+- 32	3.6+-1.0	+0.1+-0.3	116+- 27	50+- 64
44°26'N.	187	95	6	1.2+-0.6	281+- 89	2.2+-0.5	136+- 82	2.4+-0.6	-0.1+-1.1	137+- 84	353+- 22
63°29'W.											
S5	262	50	1470	6.2+-4.9	149+- 2	4.6+-4.6	108+- 43	6.7+-5.1	-3.7+-4.9	138+- 11	63+- 0
42°30'N.	262	150	1370	4.5+-1.6	145+- 4	2.2+-1.7	87+- 1	4.7+-1.8	-1.8+-1.4	138+- 2	74+- 8
63°30'W.	370	1534	10	1.7	96	2.3	287	2.8	-0.3	283	324

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued.

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
SS5	14	150	1575	3.5	273	6.5	227	7.0	-2.3	235	23
42°35'N. 63°30'W.	14	1000	725	5.3+-0.0	132+- 2	2.9+-0.2	359+- 6	5.7+-0.1	-2.0+-0.0	320+- 1	294+- 3
SS4	94	20	1000	14.5+-4.1	98+- 16	12.6+-2.0	12+- 22	14.7+-4.3	-12.4+-1.7	278+- 2	269+- 21
42°40'N.	584	50	970	3.1+-0.1	111+- 6	3.9+-0.1	354+- 1	4.4+-0.1	-2.5+-0.2	335+- 3	329+- 5
63°30'W.	204	100	920	3.8	166	3.7	37	4.8	-2.3	10	314
	676	150	870	5.8+-2.8	132+- 20	4.8+-2.0	20+- 34	6.2+-2.4	-4.2+-2.6	330+- 20	299+- 19
	36	200	820	7.2	165	4.3	70	7.2	-4.3	348	275
	363	500	520	2.4+-1.1	136+-110	1.3+-0.6	306+-131	2.7+-1.1	+0.2+-0.7	232+- 87	315+-119
	210	690	330	1.9+-0.1	102+- 26	2.3+-1.4	240+- 31	2.8+-1.4	+0.7+-0.9	278+- 21	305+- 34
	296	990	30	2.0+-0.9	153+- 71	3.5+-2.6	230+- 30	3.9+-2.5	+0.2+-1.6	228+- 34	9+- 35
S3	371	230	480	4.4	74	5.5	308	6.3	-3.1	289	326
42°45'N.	97	500	210	3.4	170	2.6	149	4.2	-0.8	162	53
63°30'W.	262	690	20	2.1	155	1.6	160	2.6	+0.1	157	53
S1	266	20	220	7.5+-3.2	3+- 38	12.0+-1.9	273+- 26	12.1+-1.9	-7.3+-3.2	272+- 19	358+- 12
42°49'N.	752	50	190	6.9+-1.8	26+- 20	9.6+-1.0	293+- 9	9.7+-0.9	-6.7+-2.0	294+- 5	360+- 12
63°30'W.	180	100	140	6.4	117	9.1	1	9.8	-5.4	347	335
	632	150	90	4.9+-1.5	72+- 31	6.7+-2.0	315+- 28	7.2+-2.1	-4.1+-1.4	299+- 28	332+- 2
	572	230	10	3.4+-0.6	61+- 15	6.1+-0.3	302+- 28	6.4+-0.2	-2.8+-0.9	293+- 27	342+- 3
S6	250	20	150	10.9	28	17.9	283	18.2	-10.3	275	347
43°00'N.	492	50	120	5.9+-0.5	60+- 16	9.6+-0.6	314+- 12	9.9+-0.5	-5.6+-0.2	305+- 7	345+- 7
63°30'W.	182	100	70	6.4	74	10.9	321	11.3	-5.7	312	342
	380	153	17	5.1+-1.5	17+- 14	9.7+-1.6	299+- 32	10.1+-1.4	-4.1+-2.0	298+- 42	362+- 25
SS13	43	14	84	4.1	91	3.2	279	5.2	-0.4	274	308
44°17'N.	13	16	82	4.2	91	1.9	257	4.6	+0.4	269	294
63°46'W.	52	89	9	2.0	117	2.8	214	2.8	+2.0	221	350
	43	95	3	2.1	158	3.6	198	4.0	+1.2	189	27
SS12	69	14	46	5.4+-0.1	102+- 6	5.5+-0.7	294+- 9	7.6+-0.5	-0.8+-1.0	288+- 3	316+- 3
44°25'N.	70	20	40	6.8	216	3.0	273	7.0	+2.4	222	75
63°57'W.	43	54	6	3.3	91	1.7	219	3.5	+1.3	263	290
S2	84	30	210	10.8	39	11.9	283	13.6	-8.5	257	321
42°46'N.	334	50	190	10.5+-0.1	109+- 53	12.9+-1.0	355+- 57	14.1+-1.1	-8.8+-0.1	334+- 53	329+- 2
64°00'W.	247	220	20	1.8+-0.8	11+- 55	12.5+-1.2	270+- 58	12.6+-1.2	-1.7+-0.8	270+- 58	359+- 1
S7	338	230	480	5.6	102	5.1	315	7.3	-2.2	296	312
42°42'N. 64°02'W.	311	690	20	1.2+-0.6	307+- 58	6.3+-1.5	197+- 16	6.3+-1.5	-1.0+-0.8	197+- 15	358+- 6

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 5. M2 TIDAL CURRENT PARAMETERS—Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF—CONT.											
C5	170	15	45	4.6+-3.3	90+- 41	7.2+-4.0	293+- 32	8.4	-1.6	286	328
43°34'N.	174	30	30	13.6	333	5.0	142	14.5	+0.8	152	290
65°06'W.	173	50	10	10.1	198	6.3	293	10.2	+6.3	14	276
C1	162	15	45	85.1+-2.3	158+- 2	21.2+-3.7	12+- 10	87.0	-11.4	340	282
43°11'N.	162	30	30	75.1+-2.0	141+- 2	22.8+-4.0	333+- 10	78.4	-4.6	322	287
65°43'W.	174	50	10	41.6+-10.4	150+- 14	16.6+-3.2	308+- 11	44.4	+5.9	327	291
C3	161	15	95	45.6+-1.6	174+- 2	29.5+-3.6	16+- 7	53.6	-9.2	360	302
42°50'N.	103	50	60	53.5+-1.4	162+- 2	35.2+-1.8	11+- 3	62.3	-14.8	350	302
65°50'W.	161	100	10	35.6+-1.8	162+- 3	27.7+-2.5	359+- 5	44.6	-6.5	349	308
NORTHEAST CHANNEL											
NEC1	174	103	120	42.3+-4.1	162+- 5	33.3+-1.5	18+- 5	51.4+- 3.0	-16.1+-1.1	355+- 3	307+- 4
42°22'N.	174	153	70	45.1+-2.6	157+- 3	41.6+-3.1	18+- 4	57.5+- 3.2	-21.4+-2.7	355+- 2	312+- 2
65°56'W.	174	207	16	27.6+-3.2	141+- 4	40.6+-1.9	350+- 6	47.8+- 0.8	-11.4+-1.8	341+- 3	327+- 4
NEC2*	58	106	134	38.3+-1.0	166+- 2	32.0+- 0.6	14+- 1	48.6+- 0.1	-11.6+-1.4	357+- 1	309+- 2
42°18'N.	174	156	84	45.3+-3.5	153+- 2	41.7+- 2.9	19+- 4	56.6+- 3.1	-24.3+-3.5	354+- 2	312+- 3
65°58'W.	58	217	17	31.9+-9.3	147+- 7	30.6+- 8.2	9+- 2	41.4+-12.2	-15.6+-2.7	347+- 4	314+- 1
NEC3*	87	112	116	46.7+-2.8	170+- 1	37.7+-2.4	21+- 6	57.9+- 2.8	-15.5+-3.9	2+- 3	308+- 0
42°11'N.	87	162	66	43.6+-3.3	154+- 4	50.6+-1.2	22+- 3	61.1+- 2.7	-26.9+-1.6	3+- 1	321+- 2
66°02'W.	174	220	16	27.4+-3.2	142+- 7	43.5+-3.9	357+- 3	49.5+- 2.8	-13.9+-3.3	348+- 2	330+- 5
GULF OF MAINE											
CASHES LEDGE	58	33	157	8.2	233	11.9	10	13.6	+4.9	22	329
43°11'N.	58	68	122	5.7+-0.7	240+- 7	7.1+-1.2	16+- 10	8.5	+3.3	32	324
69°05'W.	58	118	72	5.8+-0.7	218+- 7	8.6+-0.7	346+- 5	9.5	+4.1	359	332
MONHEGAN	57	33	65	4.2	287	7.5	356	7.7	+3.8	348	15
43°40'N.	58	68	30	3.4+-1.3	338+- 22	4.0+-1.6	32+- 24	4.7	+2.3	11	37
69°23'W.											
C.PORPOISE	74	33	65	2.7+-0.5	228+- 11	5.7+-0.7	334+- 7	5.8	+2.6	338	351
43°13'N.	74	68	30	1.1+-0.3	240+- 18	3.0+-0.5	337+- 9	3.0	+1.1	338	357
70°17'W.											
BOSTON L.S.	369	2	31	4.1	200	0.6	163	4.1	-0.4	200	83
42°20'N.											
70°45'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Data is from two separate moorings at different times.

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
BAY OF FUNDY											
BED65 45°08'N. 65°08'W.	29c	25	37a	82.0	20	64.3	22	104.2	+1.3	21	52
BED66 45°25'N. 65°07'W.	29c	25	13a	62.8	17	36.4	22	72.5	+2.7	18	60
BED64	29c	10	40a	101.2	16	61.3	27	117.9	+9.9	19	59
45°13'N. 65°14'W.	29c	25	25a	85.5	25	51.4	25	99.8	-0.4	25	59
BED63 45°19'N. 65°20'W.	29c	25	25a	78.1	20	43.3	20	89.3	+0.3	20	61
BED62 44°39'N. 66°02'W.	29c	13	77b	101.2	14	42.7	33	109.1	+12.6	17	68
BED61	29c	13	94b	77.0	18	26.1	35	81.0	+7.2	20	72
44°49'N. 66°12'W.	29c	50	57b	80.0	14	34.3	23	86.9	+5.0	15	67
BED60 45°00'N. 66°24'W.	29c	13	71b	64.6	22	32.8	41	71.8	+9.7	26	64
GEORGES BANK											
L 41°42'N. 66°36'W.	145	51	15	50.3+-0.7	142+- 2	57.8+-1.5	33+- 2	63.1+-1.4	-43.5+-0.7	8+- 3	326+- 1
P4	29	79	140	44.8	163	39.1	28	55.0	-22.7	2	309
42°12'N. 66°41'W.	29	129	90	27.0	144	44.5	359	50.2	-13.8	351	331
P5	29	19	52	63.5	161	84.3	44	91.9	-51.9	27	331
42°02'N. 66°41'W.	29	44	27	52.4	143	67.8	24	74.8	-41.8	6	329
P6	58	11	59	63.9+-2.6	126+- 0	79.7+-0.9	12+- 1	87.0+-1.5	-53.4+-2.1	352+- 1	329+- 1
41°53'N.	58	26	44	59.7+-1.8	142+- 1	71.9+-0.7	29+- 1	79.3+-1.1	-49.5+-1.4	7+- 0	327+- 1
66°41'W.	58	36	34	56.3+-1.4	176+- 2	65.2+-1.2	61+- 2	73.2+-0.3	-45.5+-0.4	37+- 1	324+- 3

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
a-water depth estimated from DMA chart 14040(old 609)
b-water depth estimated from DMA chart 13102
c-estimated to be at least 29-days

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GEORGES BANK--CONT.											
M1**	NA	77	123	10.9	164	7.1	20	12.5	-3.6	354	301
42°04'N. 67°52'W.	NA	192	8	9.4	89	21.1	311	22.3	-5.9	305	340
M4*	58	10	67	30.6	158	36.0	46	39.5+-2.2	-25.9+-2.0	23+- 3	327
40°56'N.	58	36	41	28.8	151	32.7	41	36.0+-1.5	-24.5+-1.7	15+- 2	325
66°58'W.	58	69	8	20.8	123	26.9	11	28.8+-2.2	-18.1+-1.6	353+- 4	333
P1	15	30	173	47.7	195	24.6	95	47.9	-24.1	18	277
42°12'N.	15	40	163	46.4	197	22.1	98	46.6	-21.7	19	276
67°15'W.	15	75	128	35.7	154	31.7	18	44.3	-17.7	353	310
P2	30	14	36	55.6+-6.8	151+- 6	89.8+-1.7	13+- 3	100.4+-2.1	-33.0+-0.7	3+- 1	332+- 5
42°03'N.	15	30	20	46.7	145	77.0	10	84.8	-30.0	360	333
67°15'W.											
P3	15	15	30	54.0	116	91.7	14	94.4	-49.5	8	349
41°53'N.	15	30	15	51.8	132	83.2	17	87.1	-44.9	7	340
67°15'W.	15	40	5	30.1	136	56.9	44	56.9	-30.1	43	359
M3*	58	36	8	46.7	129	55.1	22	58.8+-1.0	-41.9+-0.9	2+- 1	330
41°20'N. 67°16'W.											
M9*	58	71	8	19.7	115	32.1	6	33.0+-1.4	-18.1+-1.1	357+- 2	344
40°54'N. 67°24'W.											
A	261	15	70	27.5+-1.7	137+- 4	34.2+-2.6	27+- 2	36.6+-2.4	-24.2+-1.9	8+- 2	332+- 3
40°51'N.	957	45	40	29.4+-1.8	134+- 4	35.8+-1.4	26+- 4	38.3+-1.6	-26.0+-1.6	5+- 2	331+- 3
67°24'W.	957	75	10	22.9+-1.5	119+- 4	30.6+-1.9	8+- 5	32.5+-2.0	-20.1+-1.3	352+- 3	335+- 2
	290	84	1	14.1+-1.4	108+- 10	21.0+-1.2	360+- 6	21.8+-1.5	-12.9+-0.9	349+- 3	341+- 6
C	116	15	23	59.0+-0.7	122+- 1	71.6+-0.2	20+- 1	74.3+-0.4	-55.6+-0.5	2+- 1	336+- 1
41°24'N. 67°34'W.											
K***	58	10	54	43.8+-0.8	142+- 0	51.1+-0.3	34+- 1	55.1+-0.0	-38.7+-1.2	11+- 1	328+- 0
41°04'N.	174	15	45	42.2+-0.5	139+- 4	49.6+-1.9	30+- 3	53.6+-1.3	-37.0+-1.1	7+- 1	328+- 3
67°34'W.	58	34	30	43.8+-0.8	142+- 0	51.1+-0.3	34+- 1	55.1+-0.0	-38.7+-1.2	11+- 1	328+- 0
	174	54	10	31.8+-0.8	125+- 4	41.9+-0.8	15+- 5	44.4+-0.9	-28.2+-1.2	359+- 5	335+- 1
	87	58	4	30.3+-0.7	129+- 1	38.7+-1.1	19+- 1	41.2+-1.1	-26.8+-0.6	1+- 1	333+- 1
	232	60	1	22.1+-1.3	116+- 6	30.4+-0.9	8+- 3	31.8+-1.0	-20.2+-1.1	354+- 3	339+- 5

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - depths are based on mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.
** -data taken from figure 8 in Magnell,1980.
***-tripod and subsurface moorings were at different depths

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GEORGES BANK--CONT.											
D	87	15	69	30.5+-1.4	150+- 6	31.6+-4.1	22+- 4	39.5+-3.1	-19.3+-2.3	357+- 2	317+- 5
41°59'N. 67°47'W.											
M2*	NA	44	41	22.2	113	27.7	2	29.8	-19.2	342	331
42°00'N.	NA	77	8	13.9	61	29.0	308	29.6	-12.5	302	347
67°49'W.											
GREAT SOUTH CHANNEL											
M	145	10-H	56	29.2+-1.7	118+- 6	72.8+-3.2	35+- 3	73.2+-3.1	-28.9+-1.8	36+- 2	3+- 2
40°51'N.	171	10-R	56	28.1+-1.4	117+- 3	71.4+-1.8	34+- 2	71.5	-27.9	35	3
68°49'W.	116	51-H	15	21.9+-1.7	124+- 2	59.6+-1.9	30+- 1	59.6+-2.0	-21.8+-1.7	29+- 1	358+- 1
	124	51-R	15	22.1+-0.8	124+- 2	59.8+-0.9	29+- 1	59.8	-22.0	28	358
B	87	58	20	18.0+-1.1	97+- 9	57.7+-1.2	26+- 1	58.0+-1.0	-16.9+-1.9	28+- 1	6+- 3
40°49'N. 69°00'W.											
GSC2	109	10	73	29.1+-2.4	108+- 5	70.5+-1.8	40+- 2	71.5	-26.6	44	10
40°51'N.	152	32	41	27.9+-2.0	107+- 3	69.3+-1.7	37+- 2	70.1	-25.9	40	9
69°01'W.											
N	145	68	15	21.9+-0.5	95+- 3	56.1+-0.9	31+- 1	57.1+-0.9	-19.3+-0.6	35+- 1	11+- 1
40°51'N. 69°01'W.											
R	116	79	1	17.3+-0.9	66+- 7	23.7+-1.4	13+- 4	26.7+-0.6	-12.2+-0.8	28+- 3	31+- 5
40°30'N. 69°07'W.											
GSC1	149	27	37	28.6+-0.7	89+- 2	59.6+-0.9	40+- 1	62.9	-20.5	47	20
40°52'N.	149	49	15	27.3+-1.0	77+- 2	48.6+-0.7	33+- 1	53.0	-17.4	42	25
69°11'W.											
LYDONIA CANYON**											
LCA	116	80	20	22.2+-1.1	113+- 5	33.2+-1.4	11+- 3	33.7+-1.3	-21.3+-1.1	3+- 2	347+- 3
40°34'N.	58	99	1	10.4+-2.3	119+- 10	16.6+-1.7	357+- 3	17.6+-1.5	- 8.3+-3.1	346+- 0	337+- 2
67°45'W.											
LCB	145	92	190	19.0+-2.1	114+- 2	25.2+-0.7	13+- 3	25.8+-0.9	-18.2+-2.1	360+- 5	343+- 4
40°32'N.	145	227	55	2.0+-0.9	75+- 58	3.8+-2.3	248+- 72	4.3+-2.3	+ 0.4+-1.0	244+- 70	327+- 18
67°43'W.	116	277	5	2.3+-2.0	7+- 28	6.1+-3.8	151+- 29	6.5+-4.2	+ 0.6+-0.5	153+- 30	344+- 11

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H = harmonic analysis R = response analysis
* - Data taken from Figure 8 in Magnell,1980.
**- Observations from stations LCB(except 277m),LCE,LCH(except 1375 and 1454m),LCI,LCJ(except 454m), and LCN all begin at 0100 on Dec.2,1980 and end at 0100 on April 26,1981. Observations at LCA(80m),LCB(277m),LCJ(83m),LCK(454m) and LCL begin at 0100 on Dec.2,1980 but end 29 days earlier on March 28, 1981.

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
LYDONIA CANYON--CONT.											
LCC 40°29'N. 67°44'W.	116	134	50	9.1+-2.4	113+- 4	15.6+-3.5	2+- 2	16.2+-3.6	- 8.1+-2.1	353+- 3	343+- 4
LCD 40°29'N. 67°41'W.	116	143	50	9.9+-1.8	96+- 13	22.5+-2.1	358+- 8	22.6+-2.2	- 9.7+-1.7	356+- 7	356+- 4
LCE	145	116	484	11.6+-2.7	125+- 6	18.9+-1.9	23+- 4	19.1+-2.0	-11.2+-2.7	17+- 4	350+- 3
40°25'N.	145	216	384	5.3+-0.8	10+- 22	11.8+-0.8	7+- 5	12.9+-0.7	- 0.3+-1.7	8+- 7	24+- 4
67°40'W.	145	595	5	6.0+-0.6	21+- 12	14.7+-1.2	24+- 13	15.8+-1.3	+ 0.3+-0.6	23+- 13	22+- 1
LCF	145	205	300	6.4+-1.6	104+- 25	8.8+-1.4	12+- 15	8.9+-1.5	- 6.2+-1.5	12+- 17	360+- 17
40°21'N. 67°39'W.	174	405	100	5.4+-0.8	355+- 7	4.4+-0.4	358+- 9	7.0+-0.8	+ 0.2+-0.4	356+- 7	51+- 3
LCG	174	195	300	6.7+-1.0	85+- 23	6.9+-2.2	14+- 26	8.6+-0.8	- 4.6+-1.7	24+- 45	24+- 42
40°21'N. 67°42'W.	174	395	100	3.1+-0.5	21+- 9	4.2+-0.6	357+- 6	5.1+-0.7	- 1.0+-0.2	5+- 8	36+- 5
LCH*	145	290	1264	4.3+-1.5	131+- 9	6.9+-2.2	21+- 11	7.1+-2.1	- 4.0+-1.6	13+- 13	344+- 8
40°18'N.	145	540	1014	1.6+-0.4	31+- 23	3.3+-1.0	312+- 20	3.4+-0.9	- 1.5+-0.4	307+- 43	355+- 30
67°40'W.	145	890	664	1.4+-0.3	188+- 7	3.5+-0.5	2+- 17	3.8+-0.5	+ 0.1+-0.3	3+- 16	339+- 4
	29	1454	100	1.2	25	5.5	342	5.5	- 0.8	343	10
	87	1375	5	1.1+-0.1	101+- 28	5.8+-0.9	332+- 19	5.8+-0.9	- 0.8+-0.3	331+- 19	354+- 3
LCI	145	10	240	10.0+-3.9	141+- 19	11.6+-2.5	45+- 20	11.8+-2.6	- 9.6+-3.8	34+- 30	349+- 30
40°23'N.	145	55	195	9.1+-2.7	125+- 16	10.8+-1.8	35+- 17	11.2+-1.9	- 8.7+-2.3	46+- 44	12+- 33
67°33'W.	145	195	55	9.9+-3.6	106+- 12	9.3+-1.9	18+- 6	11.0+-3.8	- 8.0+-1.3	358+- 49	342+- 53
	145	245	5	3.8+-0.7	57+- 23	6.0+-1.6	316+- 19	6.3+-1.1	- 3.3+-0.5	302+- 33	340+- 25
LCJ	116	83	488	6.4+-2.0	129+- 20	9.1+-2.7	45+- 13	9.1+-2.7	- 6.2+-2.1	50+- 8	8+- 10
40°21'N.	145	223	348	4.9+-2.6	127+- 11	7.2+-2.6	30+- 11	7.3+-2.6	- 4.8+-2.6	24+- 11	351+- 9
67°32'W.	145	471	100	1.2+-0.4	5+- 92	1.6+-0.6	227+- 18	1.8+-0.6	- 0.5+-0.7	212+- 21	340+- 32
LCK	145	204	350	4.0+-1.7	146+- 10	6.5+-1.6	47+- 6	6.6+-1.6	- 3.9+-1.7	42+- 6	352+- 8
40°16'N.	145	454	100	4.3+-1.3	61+- 22	4.3+-1.6	296+- 18	5.5+-1.7	- 2.6+-1.0	263+- 21	311+- 16
67°47'W.											
LCL	116	65	60	18.7+-1.3	121+- 2	22.9+-0.7	21+- 2	23.5+-0.7	-18.0+-1.3	6+- 2	340+- 2
40°32'N.	116	105	20	19.4+-3.7	106+- 4	22.6+-1.2	4+- 2	23.9+-1.9	-17.9+-2.9	341+-17	332+- 17
67°36'W.											
LCM*	145	103	20	18.8+-1.8	100+- 6	25.5+-2.5	6+- 5	25.6+-2.5	-18.6+-1.9	2+- 7	354+- 7
40°30'N.	174	119	1	10.4+-2.5	85+- 11	15.1+-3.7	344+- 8	15.5+-3.6	-9.9+-2.4	333+- 11	344+- 11
67°49'W.											
LCN	145	243	798	6.2+-0.6	105+- 10	7.4+-2.9	17+- 31	8.6+-1.3	-4.8+-1.8	15+- 55	4+- 42
40°21'N.	145	841	200	4.9+-1.1	5+- 4	7.0+-1.4	347+- 7	8.4+-1.7	-1.2+-0.3	353+- 6	34+- 2
67°40'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Two separate moorings at different depths

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS											
NANTUCKET LS 40°37'N. 69°37'W.	738	2	53	30.1+-6.3	97+- 3	35.1+-6.5	29+- 4	30.8+-7.3	-25.2+-5.4	53+- 2	34+- 1
NSA	60	5	28	7.7+-1.3	40+- 10	58.8+-7.6	344+- 7	59.0	-6.4	345	4
41°31'N. 69°36'W.	63	25	8	6.4+-0.9	16+- 8	59.3+-2.7	319+- 2	59.4	-5.4	319	3
NSB 41°26'N. 69°44'W.	42	10	12	37.0+-1.8	20+- 3	62.9+-2.2	345+- 2	70.5	-18.9	353	28
NSD 41°37'N. 69°44'W.	42	16	17	21.5+-3.3	327+- 9	41.5+-2.9	345+- 4	46.4	+5.9	341	27
POLLOCK RIP 41°37'N. 69°54'W.	369	2	12	18.6	325	66.1	307	68.0	-5.7	308	15
GREAT ROUND 41°24'N. 69°55'W.	87	2	20	59.2	12	32.0	331	64.5	-19.3	4	66
NSC 41°37'N. 69°59'W.	42	8	8	45.9+-2.3	32+- 3	14.9+-1.6	247+- 6	47.5	-8.3	35	105
I 40°43'N. 70°01'W.	29	18	23	34.0	71	24.6	347	34.2	-24.3	64	81
NSE 40°59'N. 70°04'W.	41	10	12	39.5+-11.3	10+- 16	35.0+-7.9	267+- 13	41.8	-32.2	35	121
NSFE1	172	10	36	28.1+-1.0	81+- 2	24.7+-0.9	353+- 2	28.1	-24.6	75	83
40°41'N. 70°08'W.	222	30	16	25.6+-0.7	66+- 2	22.7+-0.8	341+- 2	25.9	-22.3	50	72
Q	174	10	57	18.7+-1.3	84+- 2	17.3+-1.6	6+- 3	19.9+-1.3	-15.9+-1.6	55+- 5	55+- 5
40°30'N.	464	31	36	16.3+-0.7	82+- 3	14.5+-0.7	4+- 4	17.2+-0.7	-13.5+-0.8	57+- 3	59+- 3
70°13'W.	377	51	16	16.1+-0.9	79+- 3	14.9+-0.8	3+- 5	17.4+-0.6	-13.3+-1.0	49+- 5	54+- 7
	145	57	10	16.0+-0.8	70+- 3	13.8+-1.0	351+- 4	16.7+-0.9	-13.0+-0.8	49+- 6	64+- 5
	116	66	1	10.0+-0.4	43+- 5	7.4+-0.3	314+- 7	10.0+-0.4	-7.4+-0.3	41+- 2	88+- 4
NSFE3	46	10	78	10.5+-1.8	98+- 10	10.3+-2.3	23+- 13	11.7	-8.9	63	47
40°20'N.	209	30	58	10.9+-0.5	85+- 3	10.3+-0.5	9+- 3	11.8	-9.2	53	52
70°16'W.	209	70	18	11.7+-0.6	77+- 3	10.5+-1.0	0+- 5	12.4	-9.6	51	58

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
NSFE4	170	10	95	10.0+-1.6	96+- 9	10.9+-1.7	15+- 9	11.3	-9.6	40	30
40°13'N.	224	30	75	8.1+-0.8	94+- 5	8.1+-0.8	13+- 6	8.7	-7.4	54	45
70°18'W.	170	60	45	7.7+-0.7	87+- 5	7.1+-0.6	7+- 5	8.1	-6.7	61	59
	224	90	15	8.0+-0.9	78+- 6	8.0+-1.0	3+- 7	9.0	-6.9	41	45
NSFE5	171	10	188	3.2+-1.4	129+- 26	2.8+-1.3	50+- 26	3.4	-2.7	108	63
40°02'N.	171	30	168	2.7	109	2.3	28	2.8	-2.2	92	69
70°22'W.	171	90	108	3.4+-1.1	75+- 19	2.6+-1.1	355+- 24	3.4	-2.5	61	72
	171	120	78	4.4+-0.9	71+- 12	3.9+-1.0	347+- 15	4.5	-3.8	55	71
	171	185	13	4.1+-1.2	102+- 17	4.1+-1.2	24+- 17	4.5	-3.6	63	45
NSFE6	225	10	800	1.6+-0.9	236+- 33	2.4+-1.1	148+- 26	2.4	-1.6	150	2
39°51'N.											
70°25'W.											
NEW ENGLAND SHELF											
P	87	61	10	10.8+-0.1	63+- 3	9.8+-0.4	342+- 4	11.2+-0.0	-9.4+-0.5	38+- 6	61+- 3
40°29'N.	58	70	1	6.0+-0.1	30+- 7	5.2+-0.1	305+- 5	6.1+-0.1	-5.1+-0.2	16+- 11	74+- 5
70°30'W.											
NES743	35	20	85	5.4+-0.8	71+- 8	5.6+-1.0	341+- 10	5.6	-5.4	341	0
40°18'N.	35	60	45	4.9+-0.6	72+- 7	5.1+-0.8	343+- 9	5.1	-4.9	354	12
70°52'W.											
NES764	180	305	1995	1.6+-0.6	59+- 20	0.4+-0.4	308+- 54	1.6	-0.4	60	95
39°37'N.	180	2005	295	0.7+-0.2	74+- 19	0.1+-0.1	41+- 49	0.7	-0.1	74	83
70°56'W.											
NES742	35	20	54	8.6+-0.3	67+- 4	8.3+-0.3	340+- 5	8.7	-8.2	41	62
40°35'N.	35	60	14	7.9+-0.4	59+- 6	7.6+-0.4	331+- 6	8.0	-7.5	39	69
70°59'W.											
VINEYARD	58	2	31	10.7	63	27.6	300	23.4	-8.7	294	343
41°23'N.											
71°00'W.											
HENS&CHICK	369	2	16	19.7	318	8.9	253	20.1	-7.9	313	77
41°27'N.											
71°01'W.											
NES763	181	145	351	0.7+-0.5	117+- 42	0.7+-0.6	76+- 50	0.9	-0.3	97	45
39°56'N.											
71°03'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
NEW ENGLAND SHELF--CONT.											
NES762	139	38	45	5.9+-0.5	61+- 4	5.6+-0.5	326+- 5	6.0	-5.5	88	120
40°28'N. 71°12'W.	93	73	10	5.7+-0.8	46+- 8	6.2+-1.1	307+- 10	6.5	-5.4	101	149
NES741	35	28	30	9.2+-0.5	77+- 3	9.2+-0.5	349+- 4	9.4	-9.0	33	45
40°56'N. 71°13'W.											
BRENTON REEF	369	2	24	4.2	110	22.0	289	22.6	+0.1	289	349
41°26'N. 71°23'W.											
MIDDLE ATLANTIC BIGHT											
NES763W	183	302	202	1.7+-0.6	66+- 99	1.2+-0.5	285+- 24	2.0	-0.6	258	303
39°43'N. 71°47'W.											
P32	62	70	5	4.5	25	3.9	274	5.0	-3.3	230	303
40°15'N. 71°51'W.											
LI4	56	76	15	7.0	42	6.9	287	8.3	-5.3	253	316
40°01'N. 71°53'W.											
NES762W	172	38	45	7.4+-0.5	48+- 4	6.8+-0.6	290+- 5	8.6	-5.1	255	310
39°55'N. 71°58'W.											
LI3	168	3	64	7.9	49	6.1	298	8.5	-5.3	247	297
40°11'N. 72°00'W.											
LT5	87	21-H	46	11.9+-0.7	45+- 13	9.8+-1.6	291+- 14	13.1+-0.9	-8.0+-1.1	246+- 20	302+- 10
40°12'N.	70	21-R	46	12.3+-1.3	50+- 6	9.4+-1.3	300+- 8	13.1	-8.3	247	296
72°00'W.	116	41-H	26	9.6+-2.2	45+- 36	7.4+-1.6	292+- 27	10.4+-2.6	-6.2+-1.1	242+- 40	296+- 8
	70	41-R	26	10.8+-1.1	56+- 6	8.4+-1.2	309+- 8	11.3	-7.6	253	295
	87	61-H	6	6.1+-0.0	41+- 1	5.2+-0.5	278+- 1	7.1+-0.3	-3.7+-0.1	243+- 4	307+- 5
	70	61-R	6	6.2+-0.5	41+- 5	5.0+-0.7	284+- 8	6.9	-4.0	241	302
	87	66-H	1	3.9+-0.4	26+- 20	3.2+-0.4	262+- 18	4.6+-0.3	-2.3+-0.1	226+- 18	306+- 10
	70	66-R	1	4.6+-0.5	43+- 6	3.0+-0.5	286+- 10	4.9	-2.5	235	293

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H - harmonic analysis
R - response analysis

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
LI2 40°25'N. 72°08'W.	283	3	56	8.6	54	4.9	309	8.7	-4.7	240	282
P31 40°39'N. 72°15'W.	67	42	5	7.2	43	1.6	310	7.2	-1.6	223	271
LT4	29	3	49	9.5+-2.0	67+- 3	4.0+-1.9	329+- 25	9.6+-2.0	-3.9+-2.0	247+- 0	272+- 9
40°34'N.	203	24	28	15.7+-2.5	57+- 19	6.7+-1.5	323+- 22	15.8+-2.7	-6.4+-1.2	237+- 20	272+- 7
72°19'W.	174	44	8	11.1+-0.9	62+- 6	4.3+-1.1	321+- 14	11.2+-1.0	-4.1+-1.0	244+- 5	275+- 4
	87	51	1	5.0+-0.3	51+- 5	1.3+-0.1	298+- 8	5.0+-0.3	-1.1+-0.1	232+- 5	276+- 1
LI1 40°34'N. 72°19'W.	60	33	15	7.7	73	2.8	349	7.7	-2.8	252	267
CMICE	25	4	25	10.2+-1.4	62+- 8	1.6+-0.9	314+- 31	10.2	-1.5	242	273
40°47'N.	25	8	21	10.4+-1.1	60+- 6	2.5+-1.3	288+- 29	10.5	-1.8	242	279
72°29'W.	25	16	13	9.2+-0.8	57+- 5	3.1+-0.8	270+- 14	9.6	-1.6	240	286
	25	25	4	6.6+-0.7	39+- 6	2.6+-1.2	219+- 27	7.1	+0.0	219	292
ME 39°57'N. 72°36'W.	29	59	1	4.6	24	6.1	250	7.1	-2.9	235	326
30 40°03'N. 72°42'W.	107	42	17	13.3	50	11.3	287	15.4	-8.2	251	307
LTM**	120	3	44	10.9+-0.8	114+- 0	7.8+-1.4	244+- 6	12.3+-1.5	+5.2+-0.3	279+- 2	301+- 5
40°07'N.	120	39	8	9.8+-0.3	119+- 15	7.2+-0.3	259+- 10	11.5+-0.5	+3.9+-0.3	286+- 14	304+- 1
72°55'W.											
NJ4	72	3	89	8.4+-2.1	55+- 14	6.2+-1.7	308+- 16	8.8	-5.7	250	292
38°55'N.	72	43	49	11.9+-1.5	66+- 7	9.9+-1.9	302+- 11	13.8	-7.1	267	306
72°58'W.	72	91	1	1.0+-0.4	34+- 24	0.7+-0.4	97+- 33	1.1	+0.6	229	244
MA 39°27'N. 73°00'W.	58	58	1	5.4+-0.2	17+- 5	6.0+-1.5	248+- 1	7.3+-1.3	-3.4+-0.1	226+- 9	319+- 9
LT3	154	3	67	10.9	70	9.2	308	12.6	-6.8	272	306
39°16'N.	104	9	61	13.9+-1.2	69+- 5	10.2+-1.0	307+- 6	15.4	-7.8	265	300
73°02'W.	104	19	51	16.1+-1.6	66+- 6	12.7+-1.3	305+- 6	18.1	-9.7	265	303
	70	58	12	10.7+-1.1	80+- 6	8.9+-1.1	319+- 7	12.2	-6.7	281	305

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
** average of 2-60 day records

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. (CM/SEC)	RECORD LENGTH (CM/SEC)	INSTR DEPTH	ABOVE BOTTOM (DEG-G)	FOURIER COEFFICIENTS EAST (DEG-TRUE)	PHASE	NORTH	PHASE	** CURRENT ELLIPSE PARAMETERS UMAJOR	UMINOR	PHASE	ORIEN
MIDDLE ATLANTIC BIGHT--CONT.											
LT7	84	3	63	10.2	77	7.9	296	12.2	-4.1	271	306
39°55'N.	135	58	8	8.3	90	7.4	309	10.5	-3.7	287	311
73°05'W.											
MESA7	107	18	50a	17.5+-1.9	74+- 6	10.1+-1.4	300+- 8	19.1	-6.7	263	295
39°55'N.	103	38	30a	15.1+-1.5	67+- 5	9.9+-1.4	295+- 8	16.8	-6.6	259	299
73°06'W.	63	66	2a	4.2+-0.8	84+- 12	5.0+-0.7	285+- 8	6.4	-1.2	276	320
FIRE IS.	369	2	27	6.7	91	1.0	312	6.7	-0.6	271	276
40°29'N.											
73°11'W.											
P12	115	57	5	8.0	53	7.4	290	9.6	-5.1	258	311
39°09'N.											
73°13'W.											
28	111	3	35	10.8	83	5.9	296	12.0	-2.9	270	297
40°16'N.											
73°13'W.											
MF	116	15	219	4.3+-2.9	59+- 46	5.8+-2.0	304+- 20	6.3+-2.1	-3.4+-3.0	286+- 38	330+- 19
38°31'N.	116	232	2	1.6+-0.4	345+- 15	1.8+-0.7	210+- 20	2.3+-0.8	-0.9+-0.4	191+- 16	319+- 9
73°14'W.											
NJ3	111	47	15	11.1	62	10.5	304	13.1	-7.9	270	312
39°04'N.											
73°20'W.											
15	59	3	20	12.0	86	4.0	284	12.6	-1.2	267	288
40°26'N.											
73°28'W.											
MC	29	79	1	4.9	41	5.5	271	6.7	-3.1	250	321
38°33'N.											
73°31'W.											
49	111	27	8	9.9	49	9.2	284	12.1	-6.2	253	319
39°38'N.											
73°34'W.											
MB	406	15	45	13.2+-1.3	69+- 4	12.6+-1.0	309+- 5	15.8+-1.3	-9.0+-1.0	277+- 3	312+- 3
38°44'N.	58	45	15	12.6+-1.0	58+- 5	12.5+-1.0	296+- 3	15.5+-1.0	-8.6+-1.0	267+- 4	315+- 0
73°38'W.	522	50	10	11.0+-0.8	60+- 5	11.2+-1.1	290+- 6	13.8+-0.6	-7.4+-0.7	269+- 4	316+- 5
	58	54	6	10.5+-0.2	51+- 6	10.4+-0.2	284+- 7	13.3+-0.3	-6.6+-0.0	257+- 7	314+- 0
	87	59	1	5.6+-1.0	53+- 5	5.8+-0.9	283+- 5	7.3+-1.3	-3.4+-0.4	259+- 4	316+- 2

Instrument type, method of analysis and source of data are listed alphabetically by stations in Tables 3.
If UMINOR < 0, ellipse rotates clockwise
a- water depth taken from chart 13200

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
LT6	70	3	67	7.8	61	5.4	260	9.4	-1.4	247	304
40°08'N. 73°38'W.	70	62	8	4.9	98	4.0	258	6.2	+1.1	270	309
NJ2	111	3	35	11.5	69	10.1	305	13.6	-7.2	271	308
39°10'N. 73°41'W.											
LT2	116-c	3	31	12.3+-0.8	72+- 3	11.3+-1.0	308+- 3	14.7+-0.9	-7.8+-1.2	276+- 1	311+- 1
39°24'N.	232	15	19	17.4+-1.1	73+- 6	15.5+-1.0	312+- 6	20.3+-0.7	-11.3+-1.5	278+- 7	309+- 6
73°43'W.	332	23	9	10.7	59	10.6	288	13.7	-6.2	263	316
P11	85	28	5	7.8	57	7.1	283	9.8	-4.0	257	311
39°17'N. 73°55'W.											
BARNEGAT	369	2	22	1.8	83	2.2	301	2.7	-0.9	286	322
39°46'N. 73°56'W.											
MD	116	40	1	5.3+-1.0	48+- 11	5.0+-0.4	264+- 25	6.8+-0.6	-2.2+-1.1	244+- 15	313+- 6
38°59'N. 74°02'W.											
L.EGG INLET	264	5	7	7.0	109	5.2	340	8.0	-3.5	305	302
39°28'N.	365	10	2	4.2	89	3.1	293	5.1	-1.0	278	306
74°15'W.											
NE END L.S.	369	2	24	9.8	111	4.3	334	10.3	-2.8	296	289
38°58'N. 74°30'W.											
SOUTHERN MID-ATLANTIC BIGHT											
WINTER QU	369	2	22	2.4	80	2.4	355	2.5	-2.3	210	218
37°55'N. 74°56'W.											
MAB	53	9	29	11.4+-1.1	131+- 5	9.4+-1.8	68+- 11	12.7	-7.5	290	237
36°50'N.	52	21	17	18.1+-1.6	123+- 7	10.9+-1.2	10+- 6	18.8	-9.7	313	288
75°02'W.	53	32	6	9.4+-1.1	110+- 7	7.5+-1.4	337+- 11	11.1	-4.6	307	306
DIAMOND*	738	2	51	1.3+-0.2	53+- 3	1.7+-0.1	338+- 40	1.8+-0.0	-1.1+-0.4	338+- 62	6+- 38
35°05'N. 75°20'W.											
CHESAPEAKE	369	2	17	8.0	174	0.9	3	8.0	-0.2	354	277
36°59'N. 75°42'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c- average of 4 records @ 31,31,32 and 29 m above bottom
* ratio of UMAJOR to UMAJOR of other constituents is small relative to other stations.

Table 5. M_2 tidal current parameters—Continued

Table 5. M2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
OCEANIC											
S8	415	70	2470	7.1+-2.2	101+- 26	5.9+-2.1	325+- 16	8.6+-2.5	-3.5+-1.9	298+- 21	307+- 1
42°00'N.	415	1500	1040	0.8+-0.6	185+-103	0.7+-0.7	218+- 67	1.1+-0.9	+0.1+-0.4	268+- 16	20+- 96
63°30'W.	96	2530	10	0.6	185	0.8	229	0.9	+0.4	215	34
SITE D*	104	14	2736	3.5+-0.6	118+- 20	2.8+-0.5	44+- 21	3.7	-2.6	100	65
39°20'N.	87	104	2646	2.4+-0.0	115+- 44	1.5+-0.4	19+- 52	2.4+-0.0	-1.5+-0.5	297+- 42	273+- 5
69°57'W.	153	1000	1750	1.0+-0.1	90+- 21	0.4+-0.1	345+- 63	1.1+-0.1	-0.3+-0.0	273+- 15	278+- 18
	92	2061	689	1.1+-0.2	132+- 11	0.4+-0.2	85+- 22	1.2+-0.3	-0.3+-0.2	131+- 17	75+- 2
	43	2572	178	1.1+-0.2	351+- 20	0.6+-0.2	268+- 46	1.1	-0.6	348	84
NES765	180	1995	655	0.6+-0.2	49+- 19	0.4+-0.2	240+- 24	0.7	-0.1	232	304
39°17'N.											
70°50'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Only records with values for both east and north were chosen. Where there was only 1 record (depths 14 & 2572m) the error bars are taken from Regal and Wunsch,1973.

Table 6. N_2 tidal current parameters (see table 5 for explanation).

Table 6. N2 TIDAL CURRENT PARAMETERS

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF											
SS3	135	20	79	3.8+-0.3	42+- 26	3.5+-0.9	280+- 21	4.5+-0.5	-2.5+-0.6	249+- 20	313+- 12
43°22'N.	109	50	49	3.1+-0.5	19+- 22	4.1+-1.0	263+- 11	4.5+-1.2	-2.6+-0.1	245+- 15	331+- 1
62°40'W.	47	81	18	2.5	37	2.8	273	3.3	-1.7	250	321
	121	95	4	1.6+-0.8	357+- 32	2.4+-0.4	254+- 22	2.5+-0.5	-1.5+-0.6	241+- 7	342+- 20
SS7	27	50	75	1.1	56	1.9	254	2.2	-0.3	250	331
43°02'N.	27	118	7	1.9	26	2.5	259	2.8	-1.3	242	327
62°54'W.											
SS6	26	50	85	2.0	61	1.5	273	2.4	-0.7	252	306
43°15'N.	27	130	5	0.8	149	1.2	5	1.4	-0.4	355	329
63°22'W.											
S5	262	50	1470	2.3+-2.6	170+- 4	2.7+-3.0	127+- 62	2.8+-2.9	-2.0+-2.8	134+- 52	25+- 12
42°30'N.	262	150	1370	1.3+-1.5	220+-120	1.3+-1.1	146+-102	1.6+-1.5	-0.9+-1.0	164+- 77	26+- 35
63°30'N.	370	1534	10	0.7	48	0.8	265	1.0	-0.3	249	320
SS4	585	50	970	0.8+-0.8	262+-120	0.6+-0.1	351+- 85	0.9+-0.6	-0.3+-0.3	331+- 49	332+- 59
42°40'N.	204	100	920	0.7	148	0.9	18	1.0	-0.5	1	326
63°30'W.	584	150	870	0.9+-0.6	126+- 94	0.9+-0.0	38+-115	1.1+-0.3	-0.7+-0.2	246+-93	31+- 57
	363	500	520	0.7	117	0.7	343	0.9	-0.4	322	318
	210	690	330	1.3+-0.1	19+- 17	1.9+-0.2	253+- 5	2.1+-0.3	-0.9+-0.1	240+- 7	332+- 3
	296	990	30	1.1+-0.3	81+- 53	1.1+-0.6	311+-109	1.4+-0.6	-0.6+-0.5	245+- 98	359+- 54
S3	371	230	480	0.4	70	0.9	280	1.0	-0.2	276	341
42°45'N.	97	500	210	0.9	152	1.3	103	1.4	-0.6	116	30
63°30'W.	262	690	20	0.9	110	0.4	37	0.9	-0.3	107	83
S1	266	20	220	2.4+-1.2	356+- 84	4.2+-1.7	247+- 57	4.5+-2.0	-1.8+-0.7	248+- 50	357+- 26
42°49'N.	752	50	190	1.9+-0.7	28+- 14	2.6+-1.4	273+- 5	2.9+-1.3	-1.5+-0.6	254+- 13	330+- 24
63°30'W.	180	100	140	1.0	84	1.8	326	1.9	-0.8	318	341
	632	150	90	1.4+-0.6	47+- 1	1.8+-0.5	286+- 13	2.0+-0.8	-1.0+-0.2	268+- 18	328+- 12
	572	230	10	1.4+-0.4	33+- 3	1.6+-0.4	288+- 10	1.7+-0.5	-1.2+-0.2	267+- 13	332+- 6
S6	250	20	150	3.1	357	4.6	250	4.7	-2.9	239	342
43°00'N.	492	50	120	1.1+-0.2	35+- 22	2.3+-0.3	287+- 22	2.3+-0.3	-1.1+-0.2	282+- 23	349+- 1
63°30'W.	182	100	70	1.3	72	1.9	318	2.0	-1.1	305	337
	380	153	17	1.3+-1.2	13+- 21	2.4+-1.4	266+- 19	2.4+-1.5	-1.3+-1.1	261+- 24	349+- 6
S2	84	30	210	3.1	14	2.6	287	3.1	-2.6	185	260
42°46'N.	334	50	190	2.8+-1.1	81+- 25	2.3+-1.3	325+- 54	3.0+-1.0	-2.0+-1.7	277+- 30	297+- 7
64°00'W.	247	220	20	0.8+-0.4	354+- 33	3.0+-0.6	217+- 83	3.1+-0.4	-0.3+-0.2	217+- 84	348+- 15

Instrument type, method of analysis and source of data are listed alphabetically by stations in Tables 3.
If UMINOR < 0, ellipse rotates clockwise

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
S7	338	230	480	1.0	62	1.0	293	1.3	-0.6	267	314
42°42'N. 64°02'W.	311	690	20	0.4+-0.1	184+- 29	1.1+-0.4	154+- 2	1.2+-0.3	-0.2+-0.2	156+- 1	16+- 7
C5	170	15	45	1.4+-1.0	122+- 41	2.3+-1.3	345+- 32	2.6	-0.8	335	333
43°34'N.	174	30	30	2.7	318	0.8	129	2.8	+0.1	137	287
65°06'W.	173	50	10	2.0	213	1.3	301	2.1	+1.3	215	87
C1	162	15	45	16.4+-0.4	124+- 2	4.2+-0.7	324+- 10	16.9	-1.4	305	284
43°11'N.	162	30	30	14.6+-0.4	112+- 2	3.8+-0.7	296+- 10	15.1	-0.3	292	284
65°43'W.	174	50	10	9.3+-2.3	123+- 14	2.8+-0.5	312+- 11	9.7	-0.4	304	287
C3	161	15	95	9.8+-0.3	159+- 2	5.2+-0.6	353+- 7	11.0	-1.1	342	298
42°50'N.	103	50	60	10.6+-0.3	142+- 2	7.3+-0.4	345+- 3	12.6	-2.4	329	304
65°50'W.	161	100	10	8.9+-0.5	142+- 3	5.5+-0.5	335+- 5	10.4	-1.0	326	302
NORTHEAST CHANNEL											
NEC1	174	103	120	8.5+-1.0	141+- 11	6.9+-1.7	345+- 16	10.6+-1.1	-2.4+-2.0	331+- 8	308+- 7
42°22'N.	174	153	70	9.4+-1.9	126+- 9	8.9+-2.1	346+- 9	12.2+-2.1	-4.5+-1.4	324+- 5	312+- 9
65°56'W.	174	207	16	5.9+-2.6	120+- 20	7.1+-1.7	322+- 17	9.0+-1.8	-1.9+-2.6	314+- 7	322+- 13
NEC2*	58	106	134	8.3+-0.9	138+- 17	5.4+-2.4	353+- 9	9.4+-1.3	-2.9+-2.8	329+- 6	300+- 7
42°18'N.	174	156	84	9.3+-1.1	126+- 7	8.4+-1.6	353+- 12	11.5+-1.3	-5.0+-1.5	326+- 7	311+- 6
65°58'W.	58	217	17	9.1+-2.7	152+- 50	10.0+-2.1	13+- 45	12.7+-3.3	-4.6+-0.7	355+- 45	319+- 4
NEC3*	87	112	116	11.6+-0.4	141+- 11	7.3+-1.0	358+- 9	13.1+-0.3	-3.9+-1.7	331+- 8	300+- 3
42°11'N.	87	162	66	7.9+-0.9	118+- 3	10.1+ 1.3	343+- 7	11.9+-0.9	-4.8+-1.2	327+- 8	324+- 6
66°02'W.	174	220	16	3.9+-1.3	98+- 31	9.0+-2.2	320+- 7	9.6+-1.9	-2.2+-1.5	316+- 6	341+- 12
GULF OF MAINE											
CASHES LEDGE	58	33	157	3.0	212	2.0	325	3.2	+1.8	20	292
43°11'N.	58	68	122	1.7+-0.2	209+- 7	1.3+-0.2	355+- 10	2.1	+0.6	17	306
69°05'W.	58	180	10	1.4+-0.2	184+- 7	1.7+-0.1	319+- 5	2.0	+0.8	336	323
MONHEGAN	57	33	65	1.0	254	1.5	313	1.6	+0.8	300	26
43°40'N. 69°23'W.	58	68	30	0.7+-0.3	279+- 22	1.2+-0.5	348+- 24	1.2	+0.6	340	16
C.PORPOISE	74	33	65	0.9+-0.2	204+- 11	1.3+-0.2	302+- 7	1.3	+0.9	309	350
43°13'N. 70°17'W.	74	68	30	0.1+-0.0	50+- 18	0.4+-0.1	309+- 9	0.4	-0.1	308	357
BOSTON L.S. 42°20'N. 70°45'W.	369	2	31	1.1	165	0.2	120	1.1	-0.1	164	82

Instrument type, method of analysis and source of data are listed alphabetically by stations in Tables 3.
If UMINOR < 0, ellipse rotates clockwise

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
BAY OF FUNDY											
BED65 45°08'N. 65°08'W.	29c	25	37a	16.5	355	12.9	357	20.9	+0.3	356	52
BED66 45°25'N. 65°07'W.	29c	25	13a	12.6	351	7.2	355	14.5	+0.5	352	60
BED64	29c	10	40a	20.3	351	12.3	2	23.6	+1.9	354	59
45°13'N. 65°14'W.	29c	25	25a	17.1	360	10.3	360	19.9	+0.0	360	59
BED63 45°19'N. 65°20'W.	29c	25	25a	15.7	355	8.7	355	17.9	+0.0	355	61
BED62 44°39'N. 66°02'W.	29c	13	77b	20.2	348	8.5	7	21.8	+2.5	351	68
BED61	29c	13	94b	15.4	358	5.5	19	16.2	+1.9	360	71
44°49'N.	29c	50	57b	16.0	349	6.8	358	17.4	+1.0	350	67
66°12'W.											
BED60 45°00'N. 66°24'W.	29c	13	71b	13.0	356	6.5	15	14.4	+1.9	360	64
GEORGES BANK											
L	145	51	15	10.3+-0.8	112+- 5	12.0+-1.3	8+- 7	12.8+-1.6	-9.3+-0.5	345+- 6	331+- 3
41°42'N. 66°36'W.											
P4	29	79	140	8.6	143	6.3	9	9.9	-4.0	337	303
42°12'N.	29	129	90	3.2	141	6.9	326	7.6	-0.3	325	335
66°41'W.											
P5	29	19	52	12.5	139	19.2	12	21.0	-9.1	360	333
42°02'N.	29	44	27	9.2	96	11.7	349	12.4	-8.4	332	335
66°41'W.											
P6	58	11	59	12.1+-2.3	88+- 3	16.6+-2.8	339+- 1	17.4+-2.8	-11.0+-2.4	325+- 1	338+- 2
41°53'N.	58	26	44	10.9+-1.5	105+- 0	14.1+-1.5	356+- 2	15.0+-1.6	-9.7+-1.5	339+- 2	335+- 0
66°41'W.	58	36	34	9.5+-1.3	144+- 5	11.4+-1.6	29+- 0	12.6+-1.5	-7.8+-1.5	7+- 0	327+- 2

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
a-water depth estimated from DMA chart 14040 (old 609)
b-water depth wstimated from DMA chart 13102
c-estimated to be at least 29-days

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GEORGES BANK--CONT.											
M4*	58	6	67	6.1	114	8.2	11	8.4+-1.8	-5.8+-2.0	358+- 16	342
40°56'N.	58	39	41	6.5	123	8.3	19	8.6+-1.6	-6.1+-1.4	3+- 10	338
66°58'W.	58	73	8	4.5	81	6.5	350	6.5+-2.2	-4.5+-1.8	348+- 20	358
P1	15	30	173	9.3	176	4.8	79	9.3	-4.8	358	275
42°12'N.	15	40	163	9.0	188	4.3	88	9.0	-4.2	11	276
67°15'W.	15	75	128	6.9	134	6.2	27	7.5	-5.5	341	305
P2	30	14	36	10.8+-1.3	131+- 11	17.4+-0.3	357+- 6	19.2+-0.5	-7.1+-0.1	347+- 4	333+- 6
42°03'N.	15	30	20	9.1	132	14.9	360+- 8	16.3	-6.2	350	334
67°15'W.											
P3	15	15	30	10.5	106	17.8	7	18.1	-9.9	2	351
41°53'N.	15	30	15	10.1	118	16.0	10	16.6	-9.3	1	344
67°15'W.	15	40	5	5.8	193	11.0	96	11.1	-5.8	94	355
M3*	58	36	8	9.2	93	14.5	355	14.6+-1.0	-9.0+-0.9	350+- 4	352
41°20'N.											
67°16'W.											
M9*	58	71	8	3.6	81	5.4	336	5.5+-1.4	-3.4+-1.0	326+- 16	344
40°54'N.											
67°24'W.											
A	261	15	70	6.3+-1.5	103+- 18	7.7+-1.3	358+- 15	8.2+-1.4	-5.7+-1.4	337+- 18	332+- 14
40°51'N.	957	45	40	6.6+-1.0	102+- 8	7.9+-1.2	354+- 9	8.5+-1.2	-5.8+-0.9	332+- 9	330+- 10
67°24'W.	957	75	10	4.6+-0.9	87+- 12	6.0+-1.2	335+- 14	6.5+-1.2	-4.0+-0.9	316+- 16	332+- 9
	290	84	1	3.2+-0.8	80+- 21	4.6+-0.8	333+- 11	4.9+-0.8	-2.8+-0.7	320+- 12	340+- 15
C	116	15	23	11.7+-0.8	86+- 2	14.4+-1.0	345+- 2	14.3+-1.1	-11.1+-0.7	328+- 3	339+- 2
41°24'N.											
67°34'W.											
K**	58	10	54	9.4+-1.7	107+- 5	9.3+-1.2	5+- 11	10.2+-1.2	-8.3+-1.8	324+- 1	312+- 9
41°04'N.	174	15	45	8.7+-1.0	109+- 10	11.0+-1.3	1+- 9	11.6+-1.1	-7.8+-1.2	341+- 7	332+- 8
67°34'W.	58	34	30	9.4+-1.7	107+- 5	9.3+-1.2	5+- 11	10.2+-1.2	-8.3+-1.7	323+- 1	312+- 9
	174	54	10	6.5+-0.9	92+- 11	8.4+-0.9	344+- 14	8.8+-1.0	-5.9+-1.0	327+- 12	335+- 3
	87	58	4	6.5+-1.1	94+- 9	8.1+-1.0	347+- 6	8.6+-1.3	-5.8+-0.8	329+- 7	334+- 4
	232	60	1	4.4+-0.6	82+- 8	6.4+-0.4	336+- 7	6.6+-0.5	-4.1+-0.5	324+- 6	342+- 5
D	87	15	69	7.9+-0.7	109+- 4	8.5+-1.2	345+- 3	10.4+-0.6	-5.4+-0.3	320+- 6	319+- 10
41°59'N.											
67°47'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H = harmonic analysis
R = response analysis
* - depths have been calculated from the mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.
** tripod and subsurface moorings were at different depths

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
GREAT SOUTH CHANNEL											
M	145	10-H	56	5.9+-0.9	87+- 13	16.3+-0.8	3+- 4	16.4+-0.8	-5.8+-0.8	4+- 3	3+- 4
40°51'N.	171	10-R	56	5.3+-0.3	88+- 3	15.5+-0.4	4+- 2	15.5	-5.3	5	2
68°49'W.	116	51-H	15	4.6+-0.6	92+- 5	12.5+-1.4	2+- 3	12.5+-1.4	-4.6+-0.6	2+- 2	360+- 1
	124	51-R	15	4.7+-0.2	94+- 2	13.0+-0.2	3+- 1	13.0	-4.7	3	360
B	87	58	20	4.0+-0.7	69+- 11	13.6+-0.3	359+- 2	13.7+-0.2	-3.7+-0.8	360+- 2	6+- 3
40°49'N.											
69°00'W.											
GSC2	109	10	73	6.7+-0.5	69+- 5	14.8+-0.4	11+- 2	15.3	-5.5	17	16
40°51'N.	152	42	41	6.5+-0.5	69+- 3	15.1+-0.4	6+- 2	15.4	-5.7	11	13
69°01'W.	152	76	7	1.0+-0.2	173+- 9	2.9+-0.4	299+- 8	3.0	+0.8	302	348
N	145	68	15	5.3+-0.5	67+- 6	12.7+-0.2	4+- 4	12.9+-0.2	-4.6+-0.4	8+- 4	12+- 2
40°51'N.											
69°01'W.											
R	116	79	1	4.3+-1.2	35+- 19	5.2+-1.8	336+- 8	6.0+-1.7	-3.2+-1.3	356+- 4	35+- 13
40°30'N.											
69°07'W.											
GSC1	149	27	37	6.2+-0.2	59+- 2	13.2+-0.2	16+- 1	14.0	-4.0	22	21
40°52'N.	149	49	15	6.2+-0.2	54+- 2	10.7+-0.2	13+- 1	11.8	-3.7	22	26
69°11'W.											
LYDONIA CANYON*											
LCA	116	80	20	4 4+-1.2	77+- 13	6.7+-1.4	337+- 7	6.8+-1.4	-4.3+-1.3	331+- 7	350+- 8
40°34'N.	58	99	1	2.5+-1.2	114+- 28	3.7+-1.2	344+- 4	4.0+-1.0	-1.8+-1.7	334+- 1	335+- 6
67°45'W.											
LCB	145	92	190	4.0+-1.5	85+- 10	5.2+-1.3	330+- 11	5.7+-1.3	-3.1+-1.3	311+- 18	330+- 16
40°32'N.	145	227	55	0.8+-0.5	93+- 97	2.9+-2.0	187+-102	3.0+-2.0	+0.3+-0.3	187+-102	348+- 4
67°43'W.	116	277	5	2.2+-1.3	348+- 82	4.5+-1.4	164+- 87	5.0+-1.8	+0.1+-0.3	165+- 87	337+- 8
LCC	116	134	50	3.8+-1.5	66+- 38	4.4+-1.5	323+- 23	4.8+-1.0	-3.3+-1.8	309+- 15	342+- 35
40°29'N.											
67°44'W.											
LCD	116	143	50	2.7+-0.5	50+- 15	4.7+-0.8	313+- 3	4.8+-0.8	-2.5+-0.5	310+- 7	354+- 11
40°29'N.											
67°41'W.											
LCE	145	116	484	3.4+-1.0	103+- 24	4.4+-1.5	5+- 14	4.5+-1.4	-3.1+-1.1	358+- 17	349+- 18
40°25'N.	145	216	384	1.6+-0.5	343+- 48	2.8+-0.5	338+- 49	3.1+-0.4	+0.0+-1.1	336+- 46	24+- 11
67°40'W.	145	595	5	1.5+-0.7	331+- 76	2.9+-1.2	293+- 76	3.2+-1.4	-0.5+-0.5	297+- 75	19+- 14

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise.
* - Observations from stations LCB(except 277m),LCE,LCH(except 1375 and 1454m),LCI,LCJ(except 454m, and LCN all begin at 0100 on Dec. 2, 1980 and end at 0100 on April 26, 1981. Observations at LCA(80m),LCB(277m),LCJ(83m),LCK(454m) and LCL begin at 0100 on Dec. 2, 1980 but end 29 days earlier on March 28, 1981.

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
LYDONIA CANYON--CONT.											
LCF	145	205	300	2.6+-1.3	91+- 30	2.5+-1.1	345+- 53	2.9+-1.2	-2.0+-1.3	359+- 83	360+- 55
40°21'N.	174	405	100	1.6+-0.5	303+- 40	1.4+-0.4	318+- 37	2.0+-0.6	+0.2+-0.5	310+- 35	50+- 6
67°39'W.											
LCG	174	195	300	2.4+-1.0	44+- 98	2.1+-0.5	286+- 79	3.0+-0.7	-0.5+-1.3	334+- 84	43+- 35
40°21'N.	174	395	100	0.5+-0.1	325+- 68	1.0+-0.4	289+- 71	1.1+-0.3	-0.1+-0.2	291+- 71	23+- 23
67°42'W.											
LCH**	145	290	1264	1.2+-0.6	54+- 69	2.3+-1.0	336+- 92	2.4+-1.0	-1.0+-0.5	329+-101	360+- 27
40°18'N.	145	540	1014	1.0+-0.6	281+- 81	1.1+-0.4	137+- 90	1.4+-0.5	-0.6+-0.3	41+-116	319+- 37
67°40'W.	145	890	664	0.4+-0.1	160+- 68	1.4+-0.6	357+- 50	1.4+-0.6	+0.0+-0.2	357+- 55	344+- 17
	29	1454	100	0.7	359	1.7	330	1.8	-0.3	334	21
	87	1375	5	0.3+-0.2	145+- 85	1.7+-1.2	344+- 50	1.7+-1.2	-0.2+-0.3	345+- 49	359+- 3
LCI	145	10	240	4.7+-4.4	101+- 32	4.3+-3.1	0+- 49	5.2+-4.1	-3.7+-3.4	324+- 91	356+- 62
40°23'N.	145	55	195	4.1+-2.3	111+- 12	3.4+-1.3	18+- 24	4.4+-2.4	-3.0+-1.2	344+- 63	333+- 56
67°33'W.	145	195	55	2.9+-1.3	101+- 48	2.4+-0.6	16+- 33	3.3+-1.0	-2.0+-0.6	242+- 62	233+- 55
	145	245	5	1.4+-0.6	41+- 83	1.9+-1.7	261+- 99	2.5+-1.4	-0.4+-0.6	268+- 75	352+- 66
LCJ	116	83	488	1.6+-0.6	130+- 23	2.5+-0.7	352+- 31	2.7+-0.7	-1.0+-0.9	342+- 29	331+- 10
40°21'N.	145	223	348	1.6+-1.1	123+- 71	2.5+-1.3	360+- 59	2.6+-1.2	-1.5+-1.2	350+- 60	344+- 14
67°32'W.	145	471	100	1.1+-0.5	293+- 25	0.8+-0.1	142+- 49	1.3+-0.3	-0.3+-0.4	128+- 69	323+- 66
LCK	145	204	350	1.1+-0.4	124+- 66	1.6+-0.7	17+- 74	1.8+-0.6	-0.8+-0.6	10+- 79	6+- 34
40°16'N.	145	454	100	1.3+-1.0	53+- 59	1.4+-0.7	221+-110	1.9+-0.8	-0.1+-0.7	213+- 72	328+- 39
67°47'W.											
LCL	116	65	60	4.9+-1.0	97+- 17	5.9+-0.8	349+- 15	6.3+-0.7	-4.3+-1.1	323+- 18	326+- 14
40°32'N.	116	105	20	5.9+-0.8	70+- 12	5.3+-1.8	325+- 13	6.8+-1.3	-4.2+-1.2	313+- 66	343+- 64
67°36'W.											
LCM*	145	103	20	6.0+-1.9	75+- 15	7.7+-2.6	336+- 12	7.9+-2.3	-5.7+-2.4	330+- 21	350+- 21
40°30'N.	174	119	1	3.0+-1.9	79+- 44	4.7+-2.5	332+- 30	4.9+-2.6	-2.6+-1.8	325+- 32	345+- 12
67°49'W.											
LCN	145	243	798	2.0+-1.3	102+- 67	2.5+-0.9	292+- 83	3.0+-1.4	-0.8+-1.2	317+- 90	21+- 26
40°21'N.	145	841	200	1.0+-0.6	327+- 97	1.2+-1.0	299+- 81	1.6+-1.1	-0.2+-0.3	316+- 87	43+- 20
67°40'W.											
NANTUCKET SHOALS											
NANTUCKET LS	738	2	53	7.3+-1.7	68+- 6	8.4+-2.0	356+- 11	9.0+-1.9	-6.5+-1.8	20+- 12	32+- 3
40°37'N.											
69°37'W.											
NSA	60	5	28	2.3+-0.4	23+- 10	16.3+-2.1	304+- 7	16.3	-2.3	304	2
41°31'N.	63	25	8	1.5+-0.2	346+- 8	11.9+-0.5	288+- 2	11.9	-1.3	288	4
69°36'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* tripod and subsurface mooring were at different depths.
** two separate moorings at different depths

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
NSB 41°26'N. 69°44'W.	42	10	12	6.8+-1.7	355+- 3	11.0+-0.4	319+- 2	12.4	-3.5	328	29
NSD 41°37'N. 69°44'W.	42	16	17	5.4+-0.8	292+- 9	9.3+-0.7	320+- 4	10.5	+2.2	313	29
POLLOCK RIP 41°37'N. 69°54'W.	369	2	12	3.1	282	10.5	267	11.0	-0.8	268	16
NSC 41°37'N. 69°59'W.	42	8	8	8.4+-0.4	9+- 3	1.5+-0.2	245+- 6	8.4	-1.2	190	276
I 40°43'N. 70°01'W.	29	18	23	8.4	37	6.0	310	8.4	-6.0	34	86
NSE 40°59'N. 70°04'W.	41	10	12	14.9+-4.2	333+- 16	13.2+-3.0	245+- 13	14.9	-13.2	326	82
NSFE1	172	10	36	6.1+-0.2	57+- 2	5.3+-0.2	322+- 2	6.2	-5.2	71	107
40°41'N.	222	30	16	5.5+-0.1	35+- 2	4.7+-0.2	360+- 2	6.9	-2.1	21	51
70°08'W.											
Q	174	10	57	3.8+-0.5	51+- 8	3.7+-0.7	322+- 24	4.3+-0.6	-3.2+-0.7	44+- 42	81+- 53
40°30'N.	464	31	36	3.8+-0.6	52+- 8	3.7+-0.5	327+- 12	4.1+-0.5	-3.3+-0.4	40+- 38	75+- 44
70°13'W.	377	51	16	4.0+-0.6	42+- 8	3.7+-0.7	322+- 13	4.3+-0.7	-3.3+-0.7	27+- 25	69+- 30
	145	57	10	3.5+-1.2	32+- 24	3.2+-1.7	302+- 25	3.7+-1.4	-3.0+-1.5	40+- 37	96+- 43
	116	66	1	2.4+-0.4	11+- 6	2.1+-0.4	284+- 10	2.5+-0.3	-2.0+-0.4	351+- 38	67+- 33
NSFE3	46	10	78	2.3+-0.3	90+- 10	2.4+-0.5	17+- 13	2.7	-2.0	50	41
40°20'N.	209	30	58	2.2+-0.1	60+- 3	2.1+-0.1	336+- 3	2.3	-2.0	30	57
70°16'W.	209	70	18	3.1+-0.2	34+- 3	2.9+-0.3	315+- 5	3.3	-2.7	4	55
NSFE4	170	10	95	2.8+-0.4	11+- 9	3.1+-0.5	280+- 9	3.1	-2.7	274	354
40°13'N.	224	30	75	2.1+-0.2	57+- 5	2.7+-0.3	332+- 6	2.7	-2.1	339	10
70°18'W.	170	60	45	1.8+-0.2	71+- 5	1.9+-0.2	353+- 5	2.0	-1.6	22	34
	224	90	15	1.3+-0.1	56+- 6	1.1+-0.1	337+- 7	1.3	-1.0	37	66
NSFE5*	171	10	188	1.3+-0.6	126+- 26	1.6+-0.7	51+- 26	1.7	-1.2	67	22
40°02'N.	171	30	168	1.2	131	1.7	37	1.8	-1.2	33	354
70°22'W.	171	90	108	0.5+-0.2	4+- 19	0.6+-0.2	261+- 24	0.6	-0.4	249	343
	171	120	78	0.9+-0.2	13+- 12	1.2+-0.3	265+- 15	1.2	-0.8	249	336
	171	185	13	1.9+-0.6	54+- 17	2.3+-0.7	324+- 17	2.3	-1.9	323	360

Instrument type, method of analysis and source of dat are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* Orientation is questionable

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
NSFE6 39°51'N. 70°25'W.	225	10	800	0.6+-0.3	151+- 33	0.7+-0.3	80+- 26	0.8	-0.5	104	32
NEW ENGLAND SHELF											
P	87	61	10	2.3+-0.4	35+- 4	2.3+-0.7	301+- 11	2.6+-0.5	-2.1+-0.6	250+- 64	307+- 65
40°29'N. 70°30'W.	58	70	1	1.1+-0.0	360+- 17	0.9+-0.2	261+- 20	1.1+-0.1	-0.9+-0.2	204+- 38	298+- 20
NES743	35	20	85	1.3+-0.2	300+- 8	1.3+-0.2	324+- 10	1.8	+0.4	312	45
40°18'N. 70°52'W.	35	60	45	1.3+-0.2	38+- 7	1.4+-0.2	299+- 9	1.5	-1.2	271	328
NES764	180	305	1995	0.2+-0.1	53+- 20	0.2+-0.5	85+- 54	0.3	+0.1	69	45
39°37'N. 70°56'W.	180	2005	295	0.3+-0.1	47+- 19	0.1+-0.1	317+- 49	0.3	-0.1	47	90
NES742	35	20	54	2.4+-0.1	42+- 4	2.5+-0.1	316+- 5	2.5	-2.3	344	30
40°35'N. 70°59'W.	35	60	14	2.0+-0.1	24+- 6	2.3+-0.1	288+- 6	2.3	-2.0	272	342
HENS & CHICK 41°27'N. 71°01'W.	369	2	16	6.0	292	2.4	221	6.1	-2.2	289	82
NES763 39°56'N. 71°03'W.	181	145	351	0.3+-0.2	140+- 42	0.4+-0.4	43+- 50	0.4	-0.3	35	349
NES762	139	38	45	1.4+-0.1	33+- 4	1.7+-0.1	305+- 5	1.7	-1.4	309	5
40°28'N. 71°12'W.	93	73	10	0.8+-0.1	16+- 8	0.9+-0.2	288+- 10	0.9	-0.8	295	8
NES741 40°56'N. 71°13'W.	35	28	30	1.9+-0.1	51+- 3	2.4+-0.1	315+- 4	2.4	-1.9	306	348
BRENTON REEF 41°26'N. 71°23'W.	369	2	24	1.1	48	5.8	279	5.8	-0.8	279	353

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise.

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT											
NES763W 39°43'N. 71°47'W.	183	302	202	0.8+-0.3	43+- 19	0.7+-0.3	299+- 24	0.8	-0.6	247	301
NES762W 39°55'N. 71°58'W.	172	38	45	1.9+-0.1	34+- 4	1.8+-0.1	281+- 5	2.2	-1.4	244	311
LT5	87	21-H	46	2.4+-0.4	40+- 22	2.4+-0.3	279+- 16	3.0+-0.4	-1.7+-0.3	248+- 21	314+- 3
40°12'N.	70	21-R	46	1.7+-0.2	42+- 6	2.1+-0.3	284+- 8	2.3	-1.3	264	327
72°00'W.	116	41-H	26	2.6+-0.9	30+- 65	2.3+-1.4	278+- 44	3.1+-1.2	-1.8+-1.0	263+- 16	331+- 67
	70	41-R	26	2.2+-0.2	27+- 6	1.6+-0.2	284+- 8	2.3	-1.5	219	287
	87	61-H	6	1.3+-0.1	17+- 12	1.4+-0.4	257+- 12	1.7+-0.4	-0.9+-0.2	230+- 1	319+- 13
	70	61-R	6	1.2+-0.1	15+- 5	1.1+-0.2	256+- 8	1.4	-0.8	221	310
	87	66-H	1	1.1+-0.3	3+- 39	1.2+-0.7	244+- 35	1.5+-0.5	-0.8+-0.4	215+- 30	315+- 21
	70	66-R	1	0.9+-0.1	22+- 6	0.6+-0.1	264+- 10	1.0	-0.5	215	294
LT4	29	3	49	2.6+-0.3	47+- 7	0.9+-0.5	326+- 28	2.6+-0.3	-0.9+-0.4	225+- 3	265+- 10
40°34'N.	203	24	28	4.3+-1.6	44+- 22	2.4+-1.4	294+- 34	4.5+-1.6	-2.1+-1.4	230+- 29	281+- 22
72°19'W.	174	44	8	2.7+-0.5	34+- 22	1.6+-0.6	298+- 23	2.8+-0.5	-1.6+-0.6	215+- 27	273+- 10
	87	51	1	1.1+-0.9	39+- 35	0.6+-0.6	292+- 43	1.1+-1.0	-0.5+-0.5	226+- 31	282+- 7
CMICE	25	4	25	2.2+-0.3	46+- 8	0.2+-0.1	336+- 31	2.2	-0.2	226	268
40°47'N.	25	8	21	2.4+-0.2	37+- 6	0.4+-0.2	259+- 29	2.4	-0.3	218	277
72°29'W.	25	16	13	2.2+-0.2	41+- 5	0.6+-0.3	260+- 14	2.3	-0.4	223	282
	25	25	4	1.5+-0.1	14+- 6	0.9+-0.4	204+- 27	1.7	-0.1	197	301
ME 39°57'N. 72°36'W.	29	59	1	1.1	30	1.8	229	2.1	-0.3	223	328
NJ4	72	3	89	2.8+-0.7	26+- 14	2.2+-0.6	270+- 16	3.1	-1.8	225	301
38°55'N.	72	43	49	3.3+-0.4	56+- 7	2.8+-0.5	287+- 11	3.9	-1.8	256	308
72°58'W.	72	91	1	0.3+-0.1	114+- 24	0.3+-0.2	33+- 33	0.3	-0.3	254	225
MA 39°27'N. 73°00'W.	58	58	1	1.7+-1.1	21+- 24	1.6+-0.1	267+- 41	2.1+-0.6	-1.1+-0.7	228+- 1	311+- 38
LT3	104	9	61	3.5+-0.3	51+- 5	3.2+-0.3	286+- 6	4.2	-2.2	255	311
39°16'N.	104	19	51	3.6+-0.4	51+- 6	3.3+-0.3	292+- 6	4.2	-2.5	257	310
73°02'W.	70	58	12	2.5+-0.3	79+- 6	2.3+-0.3	305+- 7	3.1	-1.3	280	312
MESA7	107	18	50-a	3.7+-0.4	49+- 6	2.6+-0.4	324+- 8	3.7	-2.6	224	263
39°55'N.	103	38	30-a	3.6+-0.4	56+- 5	1.7+-0.2	293+- 8	3.7	-1.4	242	287
73°06'W.	63	66	2-a	0.7+-0.1	87+- 12	1.1+-0.2	276+- 8	1.3	-0.1	273	328

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H = harmonic analysis R = response analysis
a - water depth taken from DMA chart 13200

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
FIRE IS. 40°29'N. 73°11'W.	369	2	27	1.7	69	0.0	285	1.7	0.0	249	271
MF	116	15	219	1.7+-0.9	30+- 62	2.1+-1.4	308+- 26	2.4+-1.3	-1.3+-1.0	310+- 35	5+- 41
38°31'N.	116	232	2	0.5+-0.2	341+- 63	0.4+-0.2	187+- 75	0.7+-0.3	-0.2+-0.2	173+- 60	304+- 13
73°14'W.											
MC 38°33'N. 73°31'W.	29	79	1	0.6	184	0.8	140	0.9	-0.3	153	32
MB	406	15	45	3.0+-0.5	338+- 19	2.9+-0.7	220+- 23	3.6+-0.6	-2.1+-0.6	189+- 35	317+- 83
38°44'N.	58	45	15	2.5+-0.2	6+- 13	3.0+-0.7	255+- 11	3.2+-0.6	-2.1+-0.3	232+- 2	327+- 11
73°38'W.	522	50	10	2.6+-0.5	34+- 14	2.7+-0.7	276+- 16	3.3+-0.6	-1.9+-0.5	245+- 11	316+- 13
	58	54	6	1.5+-0.2	358+- 13	2.1+-0.4	239+- 10	2.4+-0.2	-1.2+-0.0	223+- 1	332+- 15
	87	59	1	1.8+-0.4	56+- 12	1.4+-0.6	280+- 26	2.2+-0.7	-0.7+-0.3	249+- 7	304+- 15
LT2	116-c	3	31	3.5+-0.2	50+- 10	3.1+-0.4	296+- 4	3.9+-0.3	-2.5+-0.4	256+- 10	308+- 8
39°24'N.	232	15	19	4.0+-1.1	56+- 10	3.6+-1.9	295+- 22	4.8+-1.7	-2.5+-1.2	260+- 24	308+- 20
73°43'W.											
BARNEGAT 39°46'N. 73°56'W.	369	2	22	0.2	11	0.4	296	0.4	-0.2	299	7
MD	116	40	1	1.1+-0.6	19+- 17	1.5+-0.5	224+- 28	1.7+-0.6	-0.5+-0.5	214+- 18	324+- 9
38°59'N. 74°02'W.											
L.EGG INLET	264	5	7	1.6	87	1.1	336	1.7	-1.0	280	291
39°28'N.	365	10	2	1.0	68	0.7	302	1.1	-0.5	261	297
74°15'W.											
NE END L.S. 38°58'N. 74°30'W.	369	2	24	1.9	98	1.1	329	2.1	-0.8	288	294
SOUTHERN MID-ATLANTIC BIGHT											
WINTER QU 37°55'N. 74°56'W.	369	2	22	0.7	38	0.5	314	0.7	-0.5	32	82
MAB	53	9	29	2.8+-0.3	108+- 5	2.9+-0.6	44+- 11	3.4	-2.1	74	43
36°50'N.	52	21	17	5.2+-0.5	95+- 7	2.9+-0.3	355+- 6	5.2	-2.8	99	98
75°02'W.	53	32	6	2.0+-0.2	72+- 7	1.3+-0.2	324+- 11	2.1	-1.2	82	107

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c - average of 4 records @ 31,31,32 and 29m above bottom

Table 6. N_2 tidal current parameters—Continued

Table 6. N2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SOUTHERN MID-ATLANTIC BIGHT--CONT.											
DIAMOND 35°05'N. 75°20'W.	738	2	51	0.6+-0.3	25+- 19	1.0+-0.5	317+- 34	1.1+-0.5	-0.5+-0.4	136+- 43	187+- 28
CHESAPEAKE 36°59'N. 75°42'W.	369	2	17	2.1	146	0.1	245	2.1	+0.1	146	91
OCEANIC											
S8	415	70	2470	1.8+-1.1	42+- 1	1.8+-0.7	266+- 24	2.3+-0.9	-1.0+-0.9	244+- 7	317+- 9
42°00'N.	415	1500	1040	0.3+-0.1	314+- 80	0.3+-0.3	184+- 60	0.4+-0.3	-0.1+-0.0	151+- 95	308+- 33
63°30'W.	96	2530	10	0.4	168	0.2	80	0.4	-0.2	167	89
NES765 39°17'N. 70°50'W.	180	1995	655	0.1+-0.0	283+- 19	0.1+-0.0	150+- 24	0.1	-0.1	127	315

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 7. S_2 tidal current parameters (see table 5 for explanation).

Table 7. S2 TIDAL CURRENT PARAMETERS

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF											
SS10	32	200	1400	0.8	179	0.8	42	1.1	-0.4	21	315
43°34'N. 59°04'W.	22	500	1100	0.5	246	0.1	274	0.5	+0.0	247	80
SS2A	35	555	245	0.9	271	1.5	193	1.5	-0.9	199	11
42°52'N. 62°00'W.											
SS8	36	1500	50	0.6	123	0.6	335	0.8	-0.2	319	315
42°37'N. 62°05'W.											
SS1A	35	290	260	1.5	240	1.9	218	2.4	-0.4	226	38
42°52'N. 62°14'W.	35	490	60	0.5	46	1.3	271	1.4	-0.3	267	344
SS3	238	20	79	3.6+-1.2	96+- 36	4.9+-2.1	339+- 24	5.4+-2.0	-2.7+-1.4	323+- 43	329+- 24
43°22'N.	149	50	49	2.4+-0.7	49+- 14	3.6+-1.1	304+- 8	3.8+-1.1	-2.2+-0.8	298+- 18	348+- 17
62°40'W.	47	81	18	1.5	75	3.3	317	3.4	-1.3	312	346
	15	91	8	0.6	318	0.5	217	0.6	-0.5	156	293
	136	95	4	1.9+-0.7	41+- 19	3.0+-0.4	289+- 13	3.1+-0.4	-1.7+-0.6	278+- 18	340+- 10
SS7	27	50	75	1.7	90	2.5	324	2.8	-1.2	310	332
43°02'N. 62°54'W.	27	118	7	0.8	126	1.5	341	1.6	-0.4	334	335
SS2	189	20	258	1.0+-1.5	90+- 46	0.8+-0.5	360+- 34	1.3+-1.4	-0.5+-0.5	350+- 63	4+- 50
43°45'N.	283	50	228	0.7+-0.2	278+-101	1.2+-0.9	317+- 37	1.4+-0.7	-0.2+-0.4	319+- 47	3+- 45
62°59'W.	166	95	183	0.6+-0.1	23+- 58	1.2+-0.6	292+- 39	1.3+-0.6	-0.5+-0.1	302+- 21	11+- 29
	259	250	28	0.6+-0.4	91+- 69	1.2+-0.6	323+- 25	1.3+-0.6	-0.4+-0.5	319+- 29	340+- 9
SS6	26	50	85	1.9	71	4.1	336	4.1	-1.9	335	357
43°15'N. 63°22'W.	27	130	5	2.2	153	3.7	15	4.1	-1.3	6	333
SS1	211	14	87	0.8+-0.6	108+- 54	1.3+-0.5	354+- 55	1.5+-0.4	-0.5+-0.4	335+- 45	330+- 27
44°26'N. 63°29'W.	187	95	6	0.5+-0.2	279+- 75	0.5+-0.1	76+- 61	0.6+-0.2	-0.0+-0.3	86+- 66	314+- 18
S5	262	50	1470	1.3+-0.8	346+- 7	1.4+-0.4	236+- 25	1.6+-0.8	-0.9+-0.3	217+- 43	332+- 28
42°30'N.	262	150	1370	0.1+-0.1	223+- 23	0.4+-0.1	208+- 27	0.4+-0.2	-0.0+-0.0	210+- 27	20+- 3
63°30'W.	370	1534	10	0.4	116	0.7	318	0.8	-0.1	313	331

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
SS5	14	150	1575	0.5	312	1.8	320	1.9	+0.1	319	15
42°35'N.	9	1000	725	1.2	179	0.9	68	1.3	-0.8	15	295
63°30'W.											
SS4	585	50	970	1.8+-0.1	91+- 82	1.9+-0.4	5+- 47	2.2+-0.2	-1.4+-0.2	13+- 11	11+- 53
42°40'N.	204	100	920	0.7	184	1.0	63	1.1	-0.5	48	333
63°30'W.	663	150	870	1.3+-0.1	168+- 78	1.3+-0.1	70+- 82	1.4+-0.1	-1.2+-0.1	348+- 98	319+- 33
	36	200	820	1.6	155	1.5	32	1.9	-1.0	1	312
	363	500	520	0.4+-0.4	305+-122	0.9+-0.8	53+-111	1.0+-0.7	-0.3+-0.4	27+- 91	348+- 42
	210	690	330	0.6+-0.4	263+- 84	0.8+-0.2	205+- 76	1.0+-0.0	-0.4+-0.1	225+- 52	34+- 36
	296	990	30	1.5+-1.0	353+- 98	1.3+-0.5	244+-108	1.7+-0.9	-1.0+-0.6	195+- 62	21+- 67
S3	371	230	480	1.6	83	1.9	340	2.0	-1.5	319	333
42°45'N.	97	500	210	0.5	252	0.8	226	0.9	-0.2	233	31
63°30'W.	262	690	20	0.5	265	0.3	269	0.5	+0.0	266	57
S1	266	20	220	2.7+-0.3	41+- 54	3.6+-0.9	348+- 57	3.9+-1.2	-1.7+-1.7	345+- 61	5+- 24
42°49'N.	752	50	190	1.7+-0.8	77+- 8	2.3+-1.1	341+- 8	2.3+-1.1	-1.7+-0.8	338+- 14	355+- 10
63°30'W.	180	100	140	0.6	207	0.7	20	0.9	+0.1	23	323
	632	150	90	0.8+-0.3	126+- 2	1.1+-0.4	347+- 43	1.2+-0.3	-0.5+-0.6	338+- 34	330+- 10
	572	230	10	1.0+-0.6	82+- 9	1.9+-0.4	335+- 27	1.9+-0.3	-1.0+-0.7	331+- 27	351+- 4
S6	250	20	150	1.4	46	2.1	316	2.1	-1.4	317	1
43°00'N.	492	50	120	2.0+-0.3	64+- 15	2.8+-0.5	336+- 9	2.8+-0.5	-2.0+-0.3	339+- 2	4+- 3
63°30'W.	182	100	70	1.3	115	2.2	5	2.3	-1.2	357	344
	380	153	17	0.5+-0.1	70+- 23	1.5+-0.2	336+- 27	1.6+-0.2	-0.5+-0.1	336+- 27	359+- 2
SS13	43	14	84	0.7	147	0.9	285	1.1	+0.4	300	324
44°17'N.	52	89	9	0.6	151	0.6	355	0.8	-0.2	343	315
63°46'W.	43	95	3	0.4	78	0.5	199	0.6	+0.3	219	327
SS12	69	14	46	2.0+-0.4	105+- 4	1.6+-1.5	322+- 30	2.5+-1.0	-0.9+-1.0	303+- 27	306+- 24
44°25'N.	70	20	40	1.1	148	0.4	311	1.2	+0.1	326	289
63°57'W.	43	54	6	0.3	233	0.6	181	0.6	-0.2	188	20
S2	84	30	210	2.3	45	2.8	296	3.0	-2.0	276	331
42°46'N.	334	50	190	1.9+-0.6	135+- 52	3.2+-0.6	21+- 67	3.3+-0.6	-1.7+-0.7	10+- 57	340+- 7
64°00'W.	247	220	20	0.7+-0.8	93+-115	2.5+-0.9	317+- 66	2.6+-0.9	-0.6+-0.9	316+- 67	356+- 2
S7	338	230	480	1.9	156	1.4	351	2.3	-0.3	341	306
42°42'N.	311	690	20	0.3+-0.2	287+- 76	1.1+-0.3	202+- 38	1.1+-0.3	-0.3+-0.2	201+- 34	358+- 11
64°02'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
C5	170	15	45	0.5+-0.4	273+- 41	2.6+-1.4	210+- 32	2.6	-0.4	211	5
43°34'N.	174	30	30	1.8	113	1.9	167	2.3	+1.2	142	43
65°06'W.	173	50	10	1.0	127	1.1	289	1.4	+0.2	117	137
C1	162	15	45	12.3+-0.3	254+- 2	3.9+-0.7	132+- 10	12.5	-3.2	77	280
43°11'N.	162	30	30	9.5+-0.3	230+- 2	2.5+-0.4	60+- 10	9.8	-0.4	51	285
65°43'W.	174	50	10	5.8+-1.5	245+- 14	1.7+-0.3	28+- 11	6.0	+1.0	63	284
C3	161	15	95	6.8+-0.2	265+- 2	3.5+-0.4	79+- 7	7.7	+0.3	84	297
42°50'N.	103	50	60	8.2+-0.2	245+- 2	4.2+-0.2	91+- 3	9.1	-1.6	70	295
65°50'W.	161	100	10	5.6+-0.3	253+- 3	3.0+-0.3	111+- 5	6.1	-1.7	80	295
NORTHEAST CHANNEL											
NEC1	174	103	120	7.4+-0.8	205+- 8	6.2+-0.7	58+- 7	9.2+-0.9	-2.7+-1.0	38+- 3	309+- 5
42°22'N.	174	153	70	7.3+-1.4	199+- 5	7.3+-1.0	56+- 9	9.7+-1.3	-3.4+-1.3	37+- 5	315+- 4
65°56'W.	174	207	16	3.9+-1.2	191+- 18	5.7+-1.2	31+- 17	6.8+-0.8	-1.2+-1.8	24+- 3	325+- 13
NEC2*	58	106	134	5.5+-0.1	201+- 5	6.7+-1.0	46+- 6	8.5+-0.8	-1.9+-0.0	36+- 4	321+- 4
42°18'N.	174	156	84	7.0+-1.1	197+- 10	6.5+-1.6	54+- 6	9.0+-1.2	-3.1+-1.7	35+- 2	312+- 6
65°58'W.	58	217	17	5.5+-2.8	163+- 62	7.4+-3.5	23+- 43	8.6+-3.7	-3.4+-2.8	10+- 49	327+- 2
NEC3*	87	112	116	8.2+-1.6	210+- 6	7.1+-1.0	59+- 15	10.6+-0.5	-2.6+-1.0	41+- 7	310+- 11
42°11'N.	87	162	66	7.5+-2.4	199+- 9	8.8+-2.6	60+- 5	10.8+-2.9	-4.1+-2.2	43+- 4	322+- 0
66°02'W.	174	220	16	3.5+-0.5	196+- 34	6.1+-1.3	26+- 6	6.8+-1.3	-0.6+-1.7	25+- 8	332+- 5
GULF OF MAINE											
CASHES LEDGE	58	33	157	2.9	32	2.2	102	3.1	+2.0	229	245
43°11'N.	58	68	122	0.6+-0.1	71+- 7	0.4+-0.1	214+- 10	0.7	+0.2	241	301
69°05'W.	58	180	10	0.8+-0.1	291+- 7	2.0+-0.2	103+- 5	2.2	+0.1	104	338
MONHEGAN	57	33	65	0.4	253	0.9	126	0.9	-0.3	120	343
43°40'N.	58	68	30	0.6+-0.2	86+- 22	1.3+-0.5	180+- 24	1.3	+0.6	181	358
69°23'W.											
C.PORPOISE	74	33	65	0.2+-0.0	91+- 11	0.8+-0.1	120+- 7	0.8	+0.1	119	13
43°13'N.	74	68	30	0.3+-0.1	317+- 18	1.0+-0.2	73+- 9	1.0	+0.3	75	352
70°17'W.											
BOSTON L.S.	369	2	31	0.8	216	0.1	258	0.8	+0.1	216	84
42°20'N.											
70°45'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise.
* - Data from two separate moorings at different times.

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
BAY OF FUNDY											
BED65 45°08'N. 65°08'W.	29c	25	37a	12.7	67	9.9	69	16.1	+0.2	68	52
BED66 45°25'N. 65°07'W.	29c	25	13a	9.6	63	5.5	68	11.1	+0.4	64	60
BED64 45°13'N. 65°14'W.	29c	10	40a	15.6	63	9.5	73	18.2	+1.4	66	59
	29c	25	25a	13.1	72	7.9	72	15.3	+0.0	72	59
BED63 45°19'N. 65°20'W.	29c	25	25a	12.1	67	6.7	67	13.8	+0.0	67	61
BED62 44°39'N. 66°02'W.	29c	13	77b	15.5	60	6.5	79	16.7	+1.9	63	68
BED61 44°49'N. 66°12'W.	29c	13	94b	11.9	64	4.0	81	12.5	+1.1	66	72
	29c	50	57b	12.3	61	5.3	70	13.4	+0.8	62	67
BED60 45°00'N. 66°24'W.	29c	13	71b	9.5	71	5.5	81	10.9	+0.8	73	60
GEORGES BANK											
L 41°42'N. 66°36'W.	145	51	15	8.0+-0.3	174+- 3	9.5+-0.6	66+- 3	10.2+-0.5	-7.0+-0.3	44+- 5	330+- 4
P4	29	79	140	5.9	204	5.1	75	7.4	-2.7	41	309
42°12'N. 66°41'W.	29	129	90	5.3	200	5.0	43	7.1	-1.4	31	313
P5	29	19	52	9.5	197	12.8	85	13.6	-8.3	69	335
42°02'N. 66°41'W.	29	44	27	6.7	158	9.3	49	9.7	-6.0	34	338
P6	58	11	59	7.6+-1.0	156+- 2	12.0+-0.3	41+- 1	12.6+-0.5	-6.6+-0.7	30+- 2	339+- 4
41°53'N.	58	26	44	7.5+-0.2	171+- 4	10.2+-0.5	59+- 2	10.8+-0.3	-6.5+-0.0	43+- 1	335+- 4
66°41'W.	58	36	34	7.2+-0.5	208+- 2	8.7+-0.5	95+- 1	9.6+-0.5	-6.1+-0.5	73+- 1	328+- 0

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise.
a - water depth estimated from DMA chart 14040 (old 609)
b - water depth estimated from DMA chart 13102.
c - estimated to be at least 29 days.

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GEORGES BANK--CONT.											
M4*	58	10	67	3.3	151	4.1	77	4.3+-2.7	-3.0+-2.0	95+- 37	25
40°56'N.	58	36	41	5.1	178	6.0	79	6.1+-1.3	-4.9+-1.7	62+- 15	338
66°58'W.	58	69	8	1.1	172	1.8	51	1.9+-2.4	-0.9+-1.7	40+- 79	337
P1	15	30	173	7.9	231	3.0	127	7.9	-2.9	54	276
42°12'N.	15	40	163	5.6	213	2.4	115	5.6	-2.4	35	274
67°15'W.	15	75	128	5.1	191	4.9	1	7.0	+0.6	6	314
P2	30	14	36	9.0+-0.9	188+- 3	14.6+-1.7	11+- 2	16.6+-1.1	-4.2+-0.3	33+- 5	330+- 6
42°03'N.	15	30	20	5.4	168	10.2	28	11.1	-3.2	20	336
67°15'W.											
P3	15	15	30	6.8	136	13.5	26	14.0	-5.7	20	347
41°53'N.	15	30	15	6.9	158	11.9	31	12.8	-5.1	21	337
67°15'W.	15	40	5	13.5	28	27.2	305	27.2	-13.4	307	5
M3*	58	36	8	6.5	164	8.8	59	9.1+-1.0	-6.1+-0.9	46+- 6	341
41°20'N.											
67°16'W.											
M9*	58	71	8	3.3	189	4.9	73	5.2+-1.5	-2.8+-1.0	59+- 17	335
40°54'N.											
67°24'W.											
A	261	15	70	3.4+-0.9	163+- 34	4.2+-0.9	50+- 19	4.7+-0.8	-2.6+-0.9	33+- 23	331+- 22
40°51'N.	957	45	40	4.3+-0.5	166+- 10	5.3+-0.6	56+- 8	5.7+-0.5	-3.7+-0.6	35+- 10	330+- 11
67°24'W.	957	75	10	3.2+-0.7	152+- 15	4.4+-0.6	37+- 13	4.7+-0.6	-2.7+-0.7	22+- 11	335+- 9
	290	84	1	2.4+-0.3	135+- 19	3.6+-0.2	27+- 8	3.8+-0.2	-2.2+-0.3	18+- 6	344+- 13
C	116	15	23	7.1+-0.2	160+- 5	9.4+-0.3	55+- 5	9.7+-0.3	-6.7+-0.2	40+- 5	339+- 1
41°24'N.											
67°34'W.											
K**	58	10	54	4.3+-1.0	185+- 11	6.8+-0.9	66+- 10	7.2+-0.6	-3.6+-1.6	56+- 9	339+- 7
41°04'N.	174	15	45	5.5+-0.5	173+- 6	7.2+-1.1	62+- 8	7.3+-1.0	-4.7+-0.7	44+- 11	333+- 10
67°34'W.	58	34	30	4.3+-1.0	185+- 11	6.8+-0.9	66+- 10	7.2+-0.6	-3.6+-1.6	56+- 9	339+- 7
	174	54	10	4.7+-0.6	158+- 5	6.4+-0.9	50+- 7	6.7+-0.8	-4.2+-0.8	36+- 10	338+- 7
	87	58	4	4.4+-0.1	161+- 7	5.9+-0.3	50+- 1	6.3+-0.1	-3.9+-0.3	34+- 3	336+- 6
	232	60	1	3.3+-0.3	148+- 7	4.7+-0.4	42+- 3	4.8+-0.4	-3.1+-0.3	30+- 5	341+- 7
D	87	15	69	6.2+-1.3	187+- 8	5.8+-0.9	65+- 17	7.4+-1.0	-4.2+-1.3	32+- 8	311+- 6
41°59'N.											
67°47'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H = harmonic analysis R = responce analysis
* - depths are based on the mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.
** - tripod and subsurface moorings were at different depths

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GREAT SOUTH CHANNEL											
M	145	10-H	56	4.1+-0.3	140+- 12	11.8+-0.8	62+- 6	11.9+-0.8	-3.9+-0.3	64+- 6	5+- 5
40°51'N.	171	10-R	56	2.3+-0.1	199+- 3	8.2+-0.2	118+- 2	8.2	-2.3	119	3
68°49'W.	116	51-H	15	3.1+-0.2	168+- 5	10.0+-0.9	64+- 4	10.0+-0.9	-3.0+-0.2	62+- 4	355+- 1
	124	51-R	15	2.6+-0.1	239+- 2	6.2+-0.1	108+- 1	6.5	-1.9	103	343
S	87	58	20	2.6+-0.7	155+- 20	9.5+-0.7	64+- 4	9.5+-0.7	-2.6+-0.6	65+- 3	360+- 5
40°49'N.											
69°00'W.											
GSC2	109	10	73	4.1+-0.3	173+- 5	9.7+-0.2	98+- 2	9.8	-3.9	101	8
40°51'N.	152	42	41	2.2+-0.2	210+- 3	8.9+-0.2	113+- 2	8.9	-2.2	113	358
69°01'W.	152	76	7	2.7+-0.4	258+- 9	4.8+-0.7	162+- 8	4.8	-2.7	159	355
N	145	68	15	3.6+-0.4	123+- 9	10.0+-0.7	66+- 3	10.2+-0.6	-3.0+-0.5	70+- 4	12+- 2
40°51'N.											
69°01'W.											
R	116	79	1	3.3+-0.4	109+- 23	4.5+-0.7	56+- 7	5.0+-0.5	-2.3+-0.9	70+- 6	29+- 8
40°30'N.											
69°07'W.											
GSC1	149	27	37	2.3+-0.1	165+- 2	8.0+-0.1	117+- 1	8.2	-1.7	119	11
40°52'N.	149	49	15	2.7+-0.1	138+- 2	7.0+-0.1	113+- 1	7.4	-1.1	116	20
69°11'W.											
LYDONIA CANYON*											
LCA	116	80	20	3.3+-0.9	143+- 10	5.4+-0.4	35+- 7	5.6+-0.3	-3.0+-0.7	24+- 6	342+- 11
40°34'N.	58	99	1	2.0+-1.1	173+- 4	1.9+-0.9	85+- 71	2.6+-1.3	-0.9+-0.5	83+-100	359+- 68
67°45'W.											
LCB	145	92	190	2.9+-1.0	139+- 25	3.9+-0.3	38+- 18	4.3+-0.6	-2.4+-0.8	34+- 32	353+- 30
40°32'N.	145	227	55	1.1+-0.4	175+- 88	2.1+-0.9	336+- 93	2.4+-1.0	+0.4+-0.2	341+- 90	333+- 8
67°43'W.	116	277	5	1.5+-0.1	67+- 85	2.4+-1.0	236+- 93	2.9+-0.9	-0.1+-0.2	241+- 90	326+- 9
LCC	116	134	50	1.6+-0.9	129+- 51	2.3+-0.9	23+- 34	2.5+-0.9	-1.4+-0.8	21+- 20	355+- 33
40°29'N.											
67°44'W.											
LCD	116	143	50	2.1+-0.8	125+- 28	4.0+-0.9	38+- 21	4.1+-0.9	-2.0+-0.9	42+- 19	6+- 10
40°29'N.											
67°41'W.											
LCE	145	116	484	3.0+-0.7	142+- 18	3.9+-0.5	51+- 20	4.0+-0.5	-2.8+-0.7	50+- 34	358+- 24
40°25'N.	145	216	384	0.7+-0.5	57+- 63	2.1+-0.9	40+- 31	2.2+-0.7	-0.2+-0.4	47+- 29	17+- 25
67°40'W.	145	595	5	1.4+-0.5	36+- 82	3.6+-0.8	11+- 98	3.8+-0.9	-0.0+-0.5	16+- 97	21+- 5

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H = harmonic R = response
* - Observations from station LCB(except 277m),LCE,LCH(except 1375 and 1454m),LCI,LCJ(except 454m), and LCN all begin at 0100 on Dec.2, 1980 and end at 0100 on April 26, 1981. Observations at LCA(80m),LCB(277m),LCJ(83m),LCK(454m) and LCL begin at 0100 on Dec. 2, 1980 but end 29 days earlier on March 28,1981.

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
LYDONIA CANYON--CONT.											
LCF	145	205	300	1.8+-1.0	117+- 39	2.0+-0.6	41+- 23	2.3+-0.8	-1.4+-0.9	51+- 37	13+- 50
40°21'N. 67°39'W.	174	405	100	1.5+-0.9	38+- 79	1.0+-0.7	47+- 64	1.8+-1.1	-0.1+-0.2	38+- 40	49+- 60
LCG	174	195	300	1.9+-0.8	93+- 90	2.0+-1.2	12+- 53	2.5+-1.1	-1.1+-0.8	17+- 68	22+- 45
40°21'N. 67°42'W.	174	395	100	0.6+-0.3	98+- 69	0.7+-0.4	31+- 76	0.9+-0.5	-0.3+-0.1	33+- 85	27+- 50
LCH*	145	290	1264	1.3+-0.3	292+-100	1.3+-0.6	83+- 82	1.5+-0.4	-0.9+-0.7	99+- 92	316+- 19
40°18'N.	145	540	1014	0.7+-0.3	82+-103	1.2+-0.4	76+-102	1.3+-0.4	-0.4+-0.3	86+- 97	15+- 26
67°40'W.	145	890	664	0.6+-0.3	186+- 63	0.9+-0.6	64+- 55	1.1+-0.7	-0.1+-0.2	58+- 43	348+- 46
	29	1454	100	0.6	68	2.1	48	2.1	-0.2	49	15
	87	1375	5	0.2+-0.2	128+- 80	1.2+-0.8	57+- 91	1.2+-0.7	-0.2+-0.1	1+- 99	21+- 38
LCI	145	10	240	2.2+-0.9	174+-103	2.7+-1.4	41+- 25	3.3+-0.9	-1.0+-1.5	30+- 44	356+- 49
40°23'N.	145	55	195	1.8+-0.9	163+- 50	1.9+-0.8	55+- 34	2.2+-0.8	-1.4+-0.9	40+- 48	328+- 33
67°33'W.	145	195	55	2.4+-1.4	100+- 32	1.6+-0.9	23+- 73	2.4+-1.4	-1.3+-1.2	74+- 73	65+- 69
	145	245	5	1.0+-0.7	200+-100	1.6+-1.1	113+- 83	1.7+-1.0	-0.8+-0.7	178+- 99	350+- 57
LCJ	116	83	488	1.7+-0.5	152+- 61	2.1+-0.9	38+- 34	2.4+-0.5	-1.0+-1.0	30+- 64	328+- 34
40°21'N.	145	223	348	1.1+-0.6	62+- 79	1.1+-0.3	316+- 63	1.2+-0.4	-0.6+-0.8	328+- 46	20+- 60
67°32'W.	145	471	100	0.7+-0.3	239+-105	0.6+-0.3	286+- 70	0.8+-0.2	-0.2+-0.5	289+- 59	340+- 66
LCK	145	204	350	1.0+-0.4	345+- 90	1.1+-0.5	116+- 91	1.5+-0.3	-0.5+-0.4	89+- 84	330+- 45
40°16'N. 67°47'W.	145	454	100	1.1+-0.7	118+- 71	1.3+-0.4	342+- 31	1.6+-0.6	-0.6+-0.7	325+- 22	331+- 24
LCL	116	65	60	3.8+-0.7	162+- 24	4.6+-1.2	55+- 12	5.1+-0.9	-3.1+-0.7	56+- 48	352+- 58
40°32'N. 67°36'W.	116	105	20	3.9+-0.9	131+- 13	4.1+-1.1	29+- 12	4.8+-1.0	-3.0+-0.6	19+- 51	343+- 52
LCM**	145	103	20	3.0+-1.8	141+- 74	3.5+-1.2	35+- 27	3.7+-1.5	-2.5+-1.9	31+- 44	361+- 31
40°30'N. 67°49'W.	174	119	1	1.5+-1.1	103+- 74	2.1+-0.4	29+- 37	2.3+-0.8	-1.1+-1.0	20+- 46	356+- 30
LCN	145	243	798	1.8+-0.8	90+- 84	1.9+-0.5	354+- 66	2.3+-0.7	-1.1+-0.8	28+- 81	33+- 28
40°21'N. 67°40'W.	145	841	200	0.8+-0.4	64+- 58	1.1+-0.7	19+- 58	1.4+-0.8	-1.6+-0.3	21+- 59	25+- 27
NANTUCKET SHOALS											
NANTUCKET LS 40°37'N. 69°37'W.	738	2	53	5.2+-1.2	129+- 6	5.6+-0.8	61+- 10	6.4+-1.0	-4.2+-1.1	90+- 4	40+- 4
NSA	60	5	28	2.7+-0.5	169+- 10	16.3+-2.1	102+- 7	16.3	-2.5	103	4
41°31'N. 69°36'W.	63	25	8	0.3+-0.0	172+- 8	9.4+-0.4	44+- 2	9.4	-0.2	44	359

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - two separate moorings at different depths.
**- tripod and subsurface mooring were at different depths

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
NSB 41°26'N. 69°44'W.	42	10	12	1.8+-0.5	130+- 3	4.7+-0.2	66+- 2	4.8	-1.6	70	11
NSD 41°37'N. 69°44'W.	42	16	17	4.1+-0.6	144+- 9	2.6+-0.2	82+- 4	4.3	-2.2	132	68
POLLOCK RIP 41°37'N. 69°54'W.	369	2	12	2.6	340	7.3	321	7.7	-0.8	323	19
GREAT ROUND 41°24'N. 69°55'W.	87	2	20	11.9	39	5.6	359	12.7	-3.3	33	69
NSC 41°37'N. 69°59'W.	42	8	8	1.9+-0.1	117+- 3	1.0+-0.1	280+- 6	2.1	+0.3	293	297
I 40°43'N. 70°01'W.	29	18	23	6.3	93	3.8	3	6.3	-3.3	273	271
NSE 40°59'N. 70°04'W.	41	10	12	5.8+-1.7	216+- 16	5.6+-1.3	164+- 13	7.2	-3.5	191	47
NSFE1	172	10	36	3.2+-0.1	141+- 2	1.7+-0.1	55+- 2	3.2	-1.7	140	87
40°41'N. 70°08'W.	222	30	16	2.3+-0.1	147+- 2	1.5+-0.1	87+- 2	2.5	-1.2	135	66
Q	174	10	57	2.9+-1.1	97+- 16	2.3+-0.9	11+- 20	3.0+-1.1	-2.2+-0.9	88+- 21	79+- 20
40°30'N.	464	31	36	2.7+-0.5	102+- 10	2.1+-0.4	18+- 16	2.8+-0.5	-2.0+-0.4	92+- 19	77+- 18
70°13'W.	377	51	16	2.9+-0.5	95+- 7	2.2+-0.7	9+- 13	2.9+-0.5	-2.1+-0.6	95+- 26	89+- 27
	145	57	10	2.1+-0.8	89+- 13	1.9+-0.5	358+- 31	2.4+-0.5	-1.5+-0.7	82+- 43	80+- 48
	116	66	1	1.8+-0.2	64+- 18	1.2+-0.2	323+- 18	1.8+-0.2	-1.2+-0.2	74+- 15	105+- 8
NSFE3	46	10	78	2.2+-0.3	155+- 10	1.0+-0.2	61+- 13	2.2	-1.0	336	272
40°20'N.	209	30	58	1.0+-0.1	135+- 3	0.3+-0.0	23+- 3	1.0	-0.3	317	277
70°16'W.	209	70	18	0.5+-0.0	197+- 3	0.7+-0.1	180+- 5	0.9	-0.1	366	215
NSFE4	170	10	95	2.4+-0.4	220+- 9	2.9+-0.4	127+- 9	2.9	-2.4	119	351
40°13'N.	224	30	75	0.2+-0.0	289+- 5	0.8+-0.1	245+- 6	0.8	-0.1	247	11
70°18'W.	170	60	45	0.6+-0.1	134+- 5	0.6+-0.1	262+- 5	0.8	+0.4	290	313
	224	90	15	0.6+-0.1	196+- 6	0.9+-0.1	164+- 7	1.0	-0.3	173	32

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
NSFE5*	171	10	188	1.1+-0.5	141+- 26	1.0+-0.5	331+- 26	1.5	-0.1	326	312
40°02'N.	171	30	168	0.7	132	0.8	318	1.1	-0.1	315	318
70°22'W.	171	90	108	0.5+-0.2	138+- 19	0.7+-0.3	100+- 24	0.9	-0.3	113	35
	171	120	78	0.6+-0.1	203+- 12	1.1+-0.3	130+- 15	1.1	-0.6	138	15
	171	185	13	0.6+-0.2	289+- 17	1.4+-0.4	225+- 17	1.4	-0.5	229	12
NSFE6	225	10	800	1.1+-0.6	118+- 33	0.8+-0.4	351+- 26	1.2	-0.6	313	301
39°51'N.											
70°25'W.											
NEW ENGLAND SHELF											
P	87	61	10	1.7+-0.5	85+- 14	1.3+-0.5	338+- 18	1.9+-0.5	-1.2+-0.6	260+- 43	271+- 38
40°29'N.	58	70	1	0.8+-0.8	354+- 70	1.1+-0.3	272+- 58	1.1+-0.3	-0.8+-0.8	230+- 5	319+- 66
70°30'W.											
NES743	35	20	85	1.0+-0.1	72+- 8	1.4+-0.2	344+- 10	1.4	-1.0	346	3
40°18'N.	35	60	45	0.1+-0.0	64+- 7	0.4+-0.1	342+- 9	0.4	-0.1	343	2
70°52'W.											
NES764	180	305	1995	0.6+-0.2	186+- 20	0.5+-0.5	93+- 54	0.6	-0.5	13	278
39°37'N.	180	2005	295	0.3+-0.1	343+- 19	0.5+-0.4	248+- 49	0.5	-0.3	245	355
70°56'W.											
NES742	35	20	54	0.9+-0.0	96+- 4	0.4+-0.0	275+- 5	1.0	-0.0	276	294
40°35'N.	35	60	14	1.2+-0.1	91+- 6	0.5+-0.0	333+- 6	1.2	-0.4	276	283
70°59'W.											
HENS&CHICK	369	2	16	4.9	329	2.3	281	5.1	-1.6	323	71
41°27'N.											
71°01'W.											
NES763	181	145	351	0.1+-0.1	301+- 42	0.8+-0.7	266+- 50	0.8	-0.1	266	6
39°56'N.											
71°03'W.											
NES762	139	38	45	1.1+-0.1	74+- 4	1.6+-0.1	304+- 5	1.8	-0.8	291	330
40°28'N.	93	78	10	0.8+-0.1	69+- 8	1.0+-0.2	282+- 10	1.2	-0.4	270	323
71°12'W.											
NES741	35	28	30	1.2+-0.1	123+- 3	0.8+-0.0	53+- 4	1.2	-0.7	111	70
40°56'N.											
71°13'W.											
BRENTON REEF	369	2	24	0.4	75	5.4	308	5.4	-0.4	308	357
41°26'N.											
71°23'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Orientation is questionable

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT											
NES763W 39°43'N. 71°47'W.	183	302	202	0.6+-0.2	302+- 19	0.8+-0.3	216+- 24	0.8	-0.6	221	7
NES762W 39°55'N. 71°58'W.	172	38	45	1.4+-0.1	61+- 4	1.9+-0.2	304+- 5	2.1	-1.1	288	332
LT5	87	21-H	46	2.3+-1.1	74+- 5	2.0+-0.9	325+- 18	2.5+-1.3	-1.6+-0.6	276+- 5	301+- 9
40°12'N.	70	21-R	46	2.8+-0.3	74+- 6	1.9+-0.3	4+- 8	2.9	-1.7	242	250
72°00'W.	116	41-H	26	1.9+-1.1	77+- 29	1.8+-1.2	319+- 12	2.2+-1.2	-1.5+-1.2	288+- 27	315+- 16
	70	41-R	26	1.4+-0.1	122+- 6	1.0+-0.1	53+- 8	1.5	-0.9	288	247
	87	61-H	6	1.7+-0.4	52+- 8	1.5+-0.2	283+- 17	2.1+-0.1	-0.9+-0.2	252+- 2	309+- 18
	70	61-R	6	0.3+-0.0	68+- 5	1.1+-0.2	228+- 8	1.1	+0.1	229	346
	87	66-H	1	1.0+-0.5	39+- 16	0.8+-0.2	274+- 8	1.2+-0.5	-0.6+-0.2	243+- 5	311+- 12
	70	66-R	1	0.6+-0.1	59+- 6	0.7+-0.1	254+- 10	0.9	-0.1	248	320
LT4	29	3	49	2.0+-0.9	33+- 59	1.0+-0.0	271+- 75	2.1+-0.8	-0.8+-0.2	222+- 50	292+- 18
40°34'N.	203	24	28	3.5+-1.2	60+- 34	2.2+-1.0	315+- 34	3.7+-1.2	-1.8+-1.1	247+- 34	283+- 21
72°19'W.	174	44	8	2.5+-0.5	72+- 24	1.5+-0.5	320+- 19	2.6+-0.5	-1.3+-0.4	260+- 28	287+- 8
	87	51	1	1.5+-0.6	80+- 2	0.8+-0.8	313+- 39	1.5+-0.6	-0.7+-0.9	265+- 4	281+- 1
CMICE	25	4	25	1.2+-0.1	76+- 8	0.7+-0.4	312+- 31	1.3	-0.5	266	292
40°47'N.	25	8	21	1.3+-0.1	94+- 6	0.6+-0.3	319+- 29	1.4	-0.4	280	290
72°49'W.	25	16	13	1.1+-0.1	85+- 5	0.7+-0.4	315+- 14	1.2	-0.5	277	297
	25	25	4	0.4+-0.0	100+- 6	0.3+-0.2	44+- 27	0.4	-0.2	263	239
ME 39°57'N. 72°36'W.	29	59	1	1.1	56	1.5	286	1.7	-0.7	271	328
NJ4	72	3	89	2.2+-0.6	71+- 14	3.0+-0.8	315+- 16	3.2	-1.8	299	333
38°55'N.	72	43	49	1.3+-0.2	166+- 7	2.9+-0.5	22+- 11	3.1	-0.7	17	339
72°58'W.	72	91	1	0.8+-0.3	30+- 24	0.3+-0.2	259+- 33	0.8	-0.2	214	285
MA 39°27'N. 73°00'W.	58	58	1	1.5+-0.3	56+- 50	1.7+-0.8	286+- 17	2.0+-0.5	-1.0+-0.8	270+- 18	324+- 17
LT3	104	9	61	1.8+-0.1	123+- 5	1.4+-0.1	331+- 6	2.2	-0.5	313	307
39°16'N.	104	19	51	1.7+-0.2	124+- 6	1.6+-0.2	337+- 6	2.2	-0.7	319	313
73°02'W.	70	58	12	4.2+-0.4	69+- 6	3.5+-0.4	310+- 7	4.8	-2.7	271	305
MESA7	107	18	50a	2.7+-0.3	135+- 6	2.2+-0.3	310+- 8	3.5	+0.1	313	309
39°55'N.	103	38	30a	1.6+-0.2	111+- 5	2.1+-0.3	348+- 8	2.4	-1.2	331	328
73°06'W.	63	66	2a	0.2+-0.0	157+- 12	0.9+-0.1	275+- 8	0.9	+0.2	276	354
FIRE IS. 40°29'N. 73°11'W.	369	2	27	1.4	114	0.6	349	1.4	-0.5	299	286

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H - harmonic analysis R - response analysis
a - water depth taken from chart 13200

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
MF	116	15	219	2.1+-0.5	146+- 89	1.4+-0.9	353+- 54	2.4+-0.3	-0.8+-0.8	318+- 61	345+- 70
38°31'N.	116	232	2	0.6+-0.1	11+- 52	0.7+-0.4	167+- 66	0.9+-0.3	+0.1+-0.4	180+- 42	322+- 31
73°14'W.											
MC	29	79	1	1.1	51	1.1	263	1.4	-0.4	247	315
38°33'N.											
73°31'W.											
MB	406	15	45	2.8+-0.6	99+- 23	2.7+-0.6	341+- 23	3.4+-0.6	-1.9+-0.5	309+- 20	313+- 13
38°44'N.	58	45	15	2.9+-1.0	87+- 9	2.7+-0.6	333+- 20	3.3+-0.8	-2.2+-0.9	295+- 3	310+- 12
73°38'W.	522	50	10	2.2+-0.6	82+- 14	2.3+-0.8	320+- 15	2.8+-0.7	-1.5+-0.6	292+- 10	317+- 12
	58	54	6	2.8+-0.8	83+- 2	2.4+-0.5	324+- 9	3.2+-0.7	-1.8+-0.7	285+- 5	306+- 9
	87	59	1	1.2+-0.3	74+- 29	1.5+-0.5	305+- 9	1.8+-0.5	-0.7+-0.3	288+- 20	325+- 13
LT2	116-c	3	31	2.7+-0.6	91+- 12	3.0+-0.9	330+- 10	3.5+-0.9	-2.0+-0.6	303+- 13	319+- 6
39°24'N.	232	15	19	3.3+-0.7	89+- 15	2.9+-0.6	336+- 26	3.9+-0.5	-2.2+-0.4	293+- 23	306+- 25
73°43'W.											
BARNEGAT	369	2	22	0.4	98	0.7	322	0.7	-0.2	313	335
39°46'N.											
73°56'W.											
MD	116	40	1	1.2+-0.3	73+- 25	1.4+-0.3	312+- 31	1.6+-0.3	-0.9+-0.3	289+- 23	323+- 6
38°59'N.											
74°02'W.											
L.EGG INLET	264	5	7	1.3	126	1.2	360	1.6	-0.8	331	312
39°28'N.	365	10	2	0.8	113	0.7	327	1.0	-0.3	308	310
74°15'W.											
NE END L.S.	369	2	24	1.7	130	1.0	331	2.0	-0.3	315	298
38°58'N.											
74°30'W											
SOUTHERN MIDDLE ATLANTIC BIGHT											
WINTER QU	369	2	22	0.3	139	0.3	3	0.4	-0.2	336	308
37°55'N.											
74°56'W.											
MAB	53	9	29	2.4+-0.2	126+- 5	1.2+-0.2	340+- 11	2.6	-0.6	312	294
36°50'N.	52	21	17	1.7+-0.2	179+- 7	1.9+-0.2	71+- 6	2.1	-1.5	44	325
75°02'W.	53	32	6	3.4+-0.4	158+- 7	3.8+-0.7	354+- 11	5.1	-0.7	347	318
DIAMOND	738	2	51	0.3+-0.1	16+- 8	0.8+-0.0	318+- 88	0.8+-0.1	-0.1+-0.1	318+- 89	2+- 13
35°05'N.											
75°20'W.											
CHESAPEAKE	369	2	17	1.8	201	0.3	63	1.9	-0.2	22	277
36°59'N.											
75°42'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c - average of 4 records @ 31, 31, 32 and 29 meters above bottom

Table 7. S_2 tidal current parameters—Continued

Table 7. S2 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
OCEANIC											
S8	415	70	2470	1.0+-0.6	171+- 28	1.0+-0.4	33+- 18	1.4+-0.6	-0.6+-0.4	12+- 30	317+- 11
42°00'N.	415	1500	1040	0.3+-0.3	125+- 13	0.1+-0.1	22+- 17	0.3+-0.3	-0.1+-0.0	17+- 82	345+- 86
63°30'W.	96	2530	10	0.0	282	0.2	302	0.2	+0.0	302	360
NES765	180	1995	655	0.5+-0.2	109+- 19	0.4+-0.2	1+- 24	0.5	-0.4	308	297
39°17'N.											
70°50'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c - average of 4 records @ 31, 31, 32 and 29 meters above bottom

Table 8. K_1 tidal current parameters (see table 5 for explanation).

Table 8. K1 TIDAL CURRENT PARAMETERS

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF											
SS10	32	200	1400	0.2	189	0.2	210	0.3	+0.1	200	45
43°34'N.	22	500	1100	0.4	253	0.8	272	0.9	+0.1	268	26
59°04'W.	12	1500	100	1.6	208	1.8	127	1.9	-1.5	149	27
SS2A	35	555	245	0.2	338	0.5	160	0.5	-0.0	160	338
42°52'N.											
62°00'W.											
SS8	5	200	1350	1.5	289	1.3	150	1.9	-0.7	126	310
42°37'N.	36	1500	50	0.3	19	0.3	14	0.4	-0.0	17	45
62°05'W.											
SS1A	35	290	260	0.8	266	0.9	137	1.1	-0.5	116	320
42°52'N.	35	490	60	0.4	332	0.2	155	0.4	-0.0	153	297
62°14'W.											
SS3	238	20	79	7.4+-2.2	270+- 7	5.0+-1.8	190+- 11	7.6+-2.2	-4.8+-1.8	255+- 74	68+- 90
43°22'N.	149	50	49	7.9+-2.7	247+- 7	5.5+-2.1	171+- 10	8.1+-2.7	-5.2+-2.0	236+- 8	74+- 2
62°40'W.	47	81	18	5.1	300	4.6	238	5.9	-3.5	275	51
	15	91	8	7.1	285	6.1	229	8.3	-4.3	263	53
	136	95	4	4.2+-1.7	282+- 13	4.0+-1.5	228+- 15	5.2+-1.9	-2.7+-1.1	257+- 11	48+- 4
SS7	27	50	75	7.4	270	4.4	198	7.6	-4.1	262	75
43°02'N.	27	118	7	4.4	308	4.3	243	5.2	-3.3	277	47
62°54'W.											
SS2	189	20	258	5.4+-1.2	248+- 46	2.4+-1.2	215+- 54	5.9+-1.5	-0.9+-0.2	245+- 47	70+- 10
43°45'N.	283	50	228	5.5+-1.7	281+- 6	2.3+-0.6	266+- 13	6.0+-1.8	-0.5+-0.4	280+- 6	68+- 6
62°59'W.	166	95	183	3.9+-1.2	279+- 10	2.7+-0.5	284+- 14	4.8+-1.2	+0.2+-0.2	281+- 11	54+- 7
	272	250	28	3.0+-1.0	294+- 13	3.7+-1.0	314+- 13	4.7+-1.4	+0.8+-0.4	306+- 12	38+- 4
SS6	26	50	85	4.4	312	2.0	241	4.5	-1.9	308	80
43°15'N.	27	130	5	2.6	309	2.9	286	3.8	-0.8	296	42
63°22'W.											
SS1	211	14	87	6.9+-3.0	273+- 79	3.2+-1.6	224+- 79	7.6+-2.9	-0.9+-1.0	264+- 83	66+- 12
44°26'N.	187	95	6	1.6+-0.3	90+- 27	5.0+-3.5	231+- 93	5.4+-3.0	+0.4+-0.2	238+- 97	9+- 40
63°29'W.											
S5	262	50	1470	1.3+-0.7	292+- 23	1.4+-1.4	174+- 41	1.7+-1.2	-0.9+-1.1	175+- 62	340+- 62
42°30'N.	262	150	1370	0.9+-0.6	331+- 1	0.8+-0.5	216+- 4	1.1+-0.7	-0.7+-0.5	178+- 5	309+- 8
63°30'W.	370	1534	10	0.3	69	0.3	201	0.4	+0.2	225	315

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
SS5	14	150	1575	0.1	163	0.4	240	0.4	+0.1	239	3
42°35'N. 63°30'W.	14	1000	725	0.4+-0.0	79+- 22	0.8+-0.1	233+- 16	0.9+-0.1	+0.2+-0.0	237+- 16	336+- 3
SS4	94	20	1000	2.1+-1.6	312+- 21	1.8+-0.6	206+- 2	2.3+-1.2	-1.5+-1.0	152+- 49	299+- 41
42°40'N.	584	50	970	1.6+-0.2	298+- 30	1.3+-0.1	188+- 60	1.8+-0.4	-1.0+-0.2	35+-108	15+- 96
63°30'W.	204	100	920	2.3	343	2.5	256	2.5	-2.3	267	13
	676	150	870	1.4+-0.3	320+- 11	1.4+-0.4	220+- 11	1.6+-0.4	-1.2+-0.3	169+- 22	305+- 23
	363	500	520	0.5+-0.1	96+- 96	0.4+-0.1	201+- 62	0.7+-0.1	+0.1+-0.3	180+- 88	329+-127
	210	690	330	0.6+-0.2	57+- 4	0.6+-0.1	182+- 14	0.7+-0.2	+0.3	202+- 21	323+- 18
	296	990	30	0.9+-0.4	53+- 23	0.5+-0.1	212+- 39	1.0+-0.3	+0.2+-0.3	230+- 28	299+- 15
S3	371	230	480	1.6	297	1.6	194	1.7	-1.4	151	310
42°45'N.	97	500	210	1.6	64	0.5	208	1.6	+0.3	242	284
63°30'W.	262	690	20	1.3	56	0.5	185	1.3	+0.4	231	286
S1	266	20	220	3.8+-0.5	290+- 6	2.9+-0.8	201+- 10	3.8+-0.5	-2.8+-0.7	251+- 93	48+- 90
42°49'N.	752	50	190	4.5+-1.7	294+- 15	2.5+-1.2	208+- 16	4.5+-1.7	-2.5+-1.2	306+-100	76+- 99
63°30'W.	180	100	140	6.8	343	4.6	252	6.8	-4.6	343	90
	632	150	90	5.8+-2.3	307+- 27	3.5+-1.3	214+- 26	5.8+-2.3	-3.5+-1.3	308+- 27	92+- 1
	572	230	10	5.5+-2.3	301+- 21	3.4+-1.1	230+- 15	5.7+-2.4	-3.1+-0.9	292+- 20	74+- 1
S6	250	20	150	7.4	268	3.8	193	7.5	-3.6	263	80
43°00'N.	492	50	120	6.0+-3.0	288+- 16	3.1+-0.8	221+- 11	6.2+-3.1	-2.7+-0.6	281+- 12	75+- 3
63°30'W.	182	100	70	7.7	322	4.6	245	7.8	-4.4	315	79
	380	153	17	4.8+-0.1	304+- 5	3.0+-0.1	239+- 4	5.1+-0.0	-2.6+-0.1	294+- 7	70+- 3
SS13	43	14	84	4.0	258	1.3	240	4.2	-0.4	256	73
44°17'N.	13	16	82	5.6	280	1.5	283	5.8	+0.1	280	75
63°46'W.	52	89	9	2.7	270	2.3	302	3.4	+1.0	283	50
	43	95	3	1.4	278	3.0	295	3.3	+0.4	292	24
SS12	69	14	46	2.7+-1.3	234+- 16	1.0+-0.6	224+- 26	2.9+-1.4	-0.1+-0.1	233+- 17	70+- 3
44°25'N.	70	20	40	3.8	250	0.9	255	3.9	+0.1	250	77
63°57'W.	43	54	6	1.1	180	0.3	269	1.1	+0.3	180	90
S2	84	30	210	6.6	303	4.2	219	6.6	-4.2	299	84
42°46'N.	334	50	190	6.8+-0.2	346+- 6	4.3+-0.5	269+- 5	6.9+-0.2	-4.2+-0.5	338+- 5	77+- 1
64°00'W.	247	220	20	3.3+-0.5	92+- 20	1.1+-1.1	271+- 47	3.6+-0.1	-0.2+-0.4	275+- 24	288+- 19
S7	338	230	480	0.6	23	0.9	257	1.0	-0.4	243	331
42°42'N. 64°02'W.	311	690	20	0.5+-0.0	143+- 1	0.6+-0.1	307+- 12	0.8+-0.1	+0.1+-0.1	313+- 9	320+- 7
C5	170	15	45	3.6+-1.8	239+- 29	1.8+-1.1	62+- 34	4.0	-0.1	239	107
43°34'N.	174	30	30	7.2	206	4.8	69	8.2	-2.9	218	120
65°06'W.	173	50	10	6.8	310	1.0	302	6.9	-0.1	310	82

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
C1	162	15	45	9.1+-1.7	330+- 11	1.8+-0.5	299+- 17	9.3	-0.9	329	80
43°11'N.	162	30	30	8.4+-1.5	326+- 10	1.6+-0.5	307+- 17	8.5	-0.5	326	80
65°43'W.	174	50	10	6.4+-0.9	330+- 8	1.4+-0.3	311+- 11	6.6	-0.5	329	78
C3	161	15	95	6.2+-1.1	0+- 11	1.9+-0.7	338+- 22	6.5	-0.7	358	74
42°50'N.	103	50	60	7.3+-0.7	353+- 5	2.8+-0.5	293+- 10	7.5	-2.4	349	78
65°50'W.	161	100	10	4.0+-0.7	11+- 11	2.6+-0.7	357+- 15	4.8	-0.5	7	57
NORTHEAST CHANNEL											
NEC1	174	103	120	2.9+-0.5	353+- 22	2.1+-1.2	50+- 13	3.4+-0.5	+1.4+-0.7	194+- 16	239+- 27
42°22'N.	174	153	70	2.9+-0.4	346+- 9	1.6+-0.7	80+- 14	3.1+-0.3	+1.4+-0.5	126+- 36	283+- 26
65°56'W.	174	207	16	3.1+-0.7	334+- 6	1.6+-0.3	89+- 11	3.2+-0.7	+1.3+-0.2	147+- 9	285+- 8
NEC2*	58	106	134	2.8+-0.8	360+- 8	2.4+-1.5	48+- 3	3.6+-0.3	+1.2+-0.1	197+- 26	232+- 33
42°18'N.	174	156	84	2.3+-0.2	342+- 17	2.3+-0.7	96+- 9	2.9+-0.6	+1.6+-0.4	118+- 46	298+- 41
65°58'W.	58	217	17	2.4+-0.6	316+- 13	1.8+-0.4	70+- 17	2.6+-0.4	+1.5+-0.2	111+- 35	304+- 23
NEC3*	87	112	116	2.2+-0.5	349+- 8	1.8+-0.4	115+- 17	2.6+-0.7	+1.2+-0.5	149+- 6	306+- 3
42°11'N.	87	162	66	2.6+-0.2	342+- 10	1.7+-0.1	137+- 10	3.0+-0.3	+0.6+-0.1	155+- 10	302+- 1
66°02'W.	174	220	16	2.7+-0.3	339+- 18	0.9+-0.3	141+- 13	2.8+-0.3	+0.3+-0.2	157+- 18	289+- 7
GULF OF MAINE											
CASHES LEDGE	58	33	157	0.7	352	0.9	67	0.9	+0.6	51	23
43°11'N.	58	68	122	0.5+-0.2	10+- 22	0.3+-0.3	71+- 52	0.5	+0.2	20	69
69°05'W.	58	180	10	0.6+-0.3	346+- 26	0.6+-0.2	48+- 22	0.7	+0.4	17	45
MONEGAN	57	33	65	0.5	2	0.5	28	0.7	+0.2	15	45
43°40'N.	58	68	30	0.9+-0.2	40+- 11	0.3+-0.1	343+- 27	0.9	-0.2	37	79
69°23'W.											
C.PORPOISE	74	33	65	0.6	339	0.7	32	0.8	+0.4	11	38
43°13'N.	74	68	30	0.1	131	0.3	55	0.3	-0.1	57	5
70°17'W.											
BOSTON L.S.	369	2	31	0.8	258	0.5	148	0.9	-0.4	86	285
42°20'N.											
70°45'W.											
BAY OF FUNDY											
BED65	29c	25	37a	1.8	113	1.2	107	2.1	-0.1	111	57
45°08'N.											
65°08'W.											
BED66	29c	25	13a	1.9	112	0.7	114	2.0	+0.0	112	71
45°25'N.											
65°07'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Data is from two separate moorings at different times

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GULF OF MAINE--CONT.											
BED64	29c	10	40a	2.1	122	1.5	139	2.5	+0.4	128	55
45°13'N. 65°14'W.	29c	25	25a	2.1	125	1.2	128	2.4	+0.0	126	59
BED63	29c	25	25a	1.6	113	1.2	121	2.0	+0.1	116	54
45°19'N. 65°20'W.											
BED62	29c	13	77b	1.9	86	1.3	118	2.2	+0.6	96	58
44°39'N. 66°02'W.											
BED61	29c	13	94b	1.5	101	0.7	132	1.6	+0.4	107	65
44°49'N. 66°12'W.	29c	50	57b	1.6	113	0.9	132	1.8	+0.3	118	62
BED60	29c	13	71b	0.7	142	0.2	317	0.7	+0.0	142	109
45°00'N. 66°24'W.											
GEORGES BANK											
L	145	51	15	3.8+-0.5	155+- 15	5.7+-0.7	84+- 9	5.9+-0.6	-3.5+-0.6	96+- 8	20+- 6
41°42'N. 66°36'W.											
P4	29	79	140	1.8	332	3.3	60	3.3	+1.8	239	182
42°12'N. 66°41'W.	29	129	90	2.6	326	3.0	36	3.3	+2.2	193	212
P5	29	19	52	2.4	118	8.9	51	9.0	-2.2	232	186
42°02'N. 66°41'W.	29	44	27	2.1	116	4.3	56	4.5	-1.8	243	197
P6	58	11	59	3.8+-0.6	126+- 12	6.7+-0.1	55+- 1	6.9+-0.3	-3.4+-0.2	242+- 6	194+- 10
41°53'N.	58	26	44	3.3+-0.6	133+- 10	6.0+-0.0	64+- 2	6.2+-0.2	-3.0+-0.2	252+- 7	195+- 10
66°41'W.	58	36	34	3.0+-0.4	152+- 5	5.2+-0.1	82+- 3	5.4+-0.3	-2.7+-0.2	270+- 7	196+- 8
M4*	58	10	67	4.9	150	3.4	79	5.1	-3.1	137	70
40°56'N.	58	36	41	4.2	168	3.4	80	4.2	-3.4	164	86
66°58'W.	58	69	8	2.8	198	3.1	125	3.4	-2.5	153	36
P1	15	30	173	1.7	137	2.5	30	2.6	-1.6	198	162
42°12'N.	15	40	163	2.6	148	1.6	32	2.7	-1.4	158	110
67°15'W.	15	75	128	1.4	38	0.6	356	1.5	-0.4	213	251

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
a-water depth estimated from DMA chart 14040(old 609)
b-water depth estimated from DMA chart 13102
c-estimated to be at least 29-days
* - depths have been calculated from the mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GEORGES BANK--CONT.											
P2	30	14	36	2.5+-0.6	91+- 6	5.0+-0.5	15+- 3	5.1+-0.5	-2.4+-0.5	199+- 1	189+- 3
42°03'N.	15	30	20	2.4	90	3.7	25	3.9	-2.1	217	202
67°15'W.											
P3	15	15	30	3.1	82	4.6	19	5.0	-2.5	212	205
41°53'N.	15	30	15	2.8	91	4.9	32	5.2	-2.3	220	201
67°15'W.	15	40	5	2.0	270	0.7	310	2.1	+0.4	92	254
M3*	58	36	8	5.5	140	5.2	74	6.4	-4.1	110	49
41°20'N.											
67°16'W.											
M9*	58	71	8	2.5	194	2.3	135	3.0	-1.7	168	50
40°54'N.											
67°24'W.											
A	261	15	70	4.7+-0.5	167+- 10	3.7+-0.8	77+- 13	4.8+-0.5	-3.5+-0.8	155+- 29	77+- 33
40°51'N.	957	45	40	4.3+-0.7	168+- 12	3.7+-0.7	89+- 11	4.6+-0.7	-3.4+-0.6	144+- 17	61+- 17
67°24'W.	957	75	10	2.7+-0.6	186+- 14	2.5+-0.6	117+- 17	3.1+-0.6	-2.0+-0.6	157+- 21	50+- 17
	290	84	1	2.1+-0.4	173+- 10	2.0+-0.4	96+- 11	2.3+-0.4	-1.8+-0.4	142+- 18	53+- 12
C	116	15	23	4.9+-0.7	127+- 7	5.1+-0.5	63+- 6	6.0+-0.7	-3.7+-0.5	93+- 9	43+- 4
41°24'N.											
67°34'W.											
K**	58	10	54	5.9+-0.2	161+- 4	4.9+-0.5	84+- 9	6.2+-0.5	-4.6+-0.2	142+- 4	65+- 10
41°04'N.	174	15	45	5.5+-0.9	156+- 7	4.8+-1.1	77+- 10	5.9+-1.0	-4.4+-1.0	116+- 53	45+- 49
67°34'W.	58	34	30	5.9+-0.2	161+- 5	4.9+-0.5	84+- 9	6.2+-0.5	-4.6+-0.2	142+- 4	65+- 11
	174	54	10	4.1+-0.7	168+- 8	3.9+-0.8	98+- 10	4.6+-0.8	-3.3+-0.8	137+- 10	50+- 5
	87	58	4	3.9+-0.3	152+- 12	3.7+-0.2	81+- 8	4.4+-0.5	-3.1+-0.1	121+- 9	50+- 1
	232	60	1	3.0+-0.6	158+- 19	2.6+-0.3	81+- 16	3.2+-0.6	-2.4+-0.3	139+- 25	65+- 18
D	87	15	69	2.1+-0.1	104+- 12	2.6+-0.2	54+- 8	3.0+-0.2	-1.3+-0.2	71+- 10	35+- 4
41°59'N.											
67°47'W.											
GREAT SOUTH CHANNEL											
M	145	10-H	56	3.9+-0.9	153+- 10	8.3+-0.9	107+- 2	8.9+-1.1	-2.5+-0.5	113+- 2	20+- 5
40°51'N.	171	10-R	56	3.8+-0.7	154+- 11	8.2+-0.8	107+- 6	8.6	-2.6	113	19
68°49'W.	116	51-H	15	2.9+-0.6	158+- 6	7.3+-0.9	107+- 2	7.5+-1.0	-2.2+-0.5	111+- 2	15+- 2
	124	51-R	15	2.8+-0.5	157+- 10	7.2+-0.9	107+- 6	7.4	-2.1	111	15
B	87	58	20	3.8+-1.0	154+- 5	8.1+-0.3	117+- 4	3.7+-0.5	-2.2+-0.8	122+- 3	22+- 5
40°49'N.											
69°00'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H = harmonic analysis R = response analysis
* - depths have been calculated from the mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.
**- tripod and subsurface moorings were at different depths

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GREAT SOUTH CHANNEL--CONT.											
GSC2	109	10	73	6.2+-1.5	131+- 14	8.6+-1.5	109+- 9	10.4	-1.9	116	35
40°51'N.	152	42	41	5.0+-0.9	135+- 10	8.8+-1.0	112+- 6	10.0	-1.7	117	29
69°01'W.	152	76	7	2.0+-0.3	304+- 10	3.9+-0.7	322+- 9	4.3	+0.6	318	27
N	145	68	15	5.0+-0.8	145+- 7	8.2+-0.9	118+- 7	9.4+-1.0	-1.9+-0.2	125+- 8	30+- 4
40°51'N. 69°01'W.											
R	116	79	1	4.3+-1.5	163+- 6	3.1+-1.3	119+- 7	4.9+-1.6	-1.9+-1.1	150+- 8	58+- 7
40°30'N. 69°07'W.											
GSC1	149	27	37	5.7+-0.7	127+- 7	8.6+-0.9	118+- 6	10.3	-0.7	121	33
40°52'N.	149	49	15	5.6+-0.7	125+- 7	6.6+-0.8	117+- 7	8.6	-0.6	120	40
69°11'W.											
LYDONIA CANYON*											
LCA	116	80	20	2.3+-1.1	175+- 8	2.3+-0.8	97+- 10	2.5+-0.9	-2.0+-1.0	112+- 60	21+- 63
40°34'N.	58	99	1	1.0+-0.1	208+- 41	1.1+-0.5	121+- 14	1.3+-0.3	-0.8+-0.1	98+- 38	336+- 65
67°45'W.											
LCB	145	92	190	2.3+-1.0	159+- 32	2.1+-0.6	74+- 21	2.6+-0.8	-1.7+-0.9	38+- 50	323+- 53
40°32'N.	145	227	55	0.4+-0.2	322+-111	0.7+-0.3	88+- 71	0.7+-0.2	-0.1+-0.3	93+- 80	336+- 16
67°43'W.	116	277	5	0.2+-0.1	173+- 85	0.7+-0.3	87+- 61	0.7+-0.3	-0.0+-0.2	87+- 63	352+- 11
LCC	116	134	50	0.9+-0.3	207+- 26	1.0+-0.3	105+- 13	1.2+-0.2	-0.6+-0.2	115+- 50	1+- 59
40°29'N. 67°44'W.											
LCD	116	143	50	1.1+-0.3	182+- 12	1.1+-0.4	79+- 16	1.4+-0.4	-0.8+-0.2	61+- 52	336+- 53
40°29'N. 67°41'W.											
LCE	145	116	484	1.3+-0.7	164+- 44	1.5+-0.6	83+- 1	1.8+-0.8	-0.9+-0.6	105+- 33	29+- 39
40°25'N.	145	216	384	0.4+-0.2	113+- 93	1.2+-0.7	150+- 37	1.3+-0.7	+0.1+-0.3	150+- 31	18+- 21
67°40'W.	145	595	5	0.9+-0.3	79+- 39	1.9+-0.7	70+- 44	2.0+-0.7	-0.1+-0.4	72+- 36	26+- 9
LCF	145	205	300	0.9+-0.8	196+- 63	1.0+-0.6	128+-110	1.3+-0.9	-0.3+-0.5	91+- 94	343+- 41
40°21'N.	174	405	100	0.8+-0.5	112+- 62	0.6+-0.4	124+- 65	1.0+-0.5	+0.2+-0.3	113+- 61	47+- 19
67°39'W.											
LCG	174	195	300	1.0+-0.6	217+- 84	0.7+-0.2	184+- 36	1.1+-0.6	-0.0+-0.4	176+- 39	38+- 48
40°21'N.	174	395	100	0.6+-0.3	147+- 52	0.6+-0.2	99+- 41	0.8+-0.3	-0.1+-0.1	114+- 52	43+- 28
67°42'W.											

Instrument types, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

* - Observations from stations LCB(except 277m),LCE,LCH(except 1375 and 1454m),LCK,LCJ(except 454m), and LCN all begin at 0100 on Dec. 2, 1980 and end at 0100 on April 26, 1981. Observations at LCA(80m),LCB(277m),LCJ(83m),LCK(454m) and LCL begin at 0100 on Dec. 2, 1980 but end 29 days earlier on March 28, 1981.

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
LYDONIA CANYON--CONT.											
LCH**	145	290	1264	0.7+-0.5	7+- 77	0.6+-0.3	340+-107	0.8+-0.4	-0.2+-0.5	274+-105	18+- 62
40°18'N.	145	540	1014	0.5+-0.4	186+- 80	0.5+-0.4	128+- 79	0.7+-0.5	-0.2+-0.5	162+- 91	0+- 48
67°40'W.	145	890	664	0.4+-0.2	305+- 87	0.6+-0.2	44+- 97	0.6+-0.2	-0.1+-0.3	47+- 88	350+- 39
	29	1454	100	0.2	4	0.9	353	1.0	-0.0	353	12
	87	1375	5	0.4+-0.2	41+-109	0.4+-0.2	235+- 88	0.6+-0.0	+0.0+-0.2	316+-100	310+- 40
LCI	145	10	240	2.5+-1.1	190+- 73	2.2+-1.1	94+- 49	2.8+-1.0	-1.7+-1.3	119+- 47	10+- 62
40°23'N.	145	55	195	1.6+-0.3	160+- 21	2.1+-0.8	86+- 48	2.5+-0.6	-1.0+-0.4	107+- 64	21+- 39
67°33'W.	145	195	55	1.1+-0.5	157+- 68	0.9+-0.5	83+- 12	1.3+-0.5	-0.4+-0.5	128+- 27	50+- 52
	145	245	5	0.6+-0.2	289+- 50	0.4+-0.3	93+- 74	0.8+-0.2	+0.0+-0.2	81+- 76	328+- 61
LCJ	116	83	488	0.7+-0.3	139+- 43	1.2+-0.6	126+- 31	1.3+-0.6	-0.3+-0.6	127+- 31	28+- 9
40°21'N.	145	223	348	0.9+-0.4	137+- 67	0.8+-0.9	96+- 62	1.2+-0.8	-0.4+-0.4	71+- 70	43+- 66
67°32'W.	145	471	100	0.7+-0.3	302+- 73	0.5+-0.2	174+-107	0.8+-0.3	+0.2+-0.2	245+- 93	350+- 70
LCK	145	204	350	0.9+-0.5	168+- 60	1.0+-0.5	82+- 23	1.3+-0.5	-0.5+-0.3	67+- 34	346+- 55
40°16'N.	145	454	100	1.0+-0.4	306+- 71	0.6+-0.3	159+-112	1.1+-0.4	-0.0+-0.3	259+- 86	53+- 57
67°47'W.											
LCL	116	65	60	2.5+-0.5	160+- 16	2.7+-0.8	67+- 35	2.9+-0.7	-2.2+-0.7	245+- 45	246+- 59
40°32'N.	116	105	20	2.3+-0.4	170+- 21	1.4+-0.6	87+- 78	2.4+-0.3	-1.2+-0.8	271+- 18	259+- 25
67°36'W.											
LCM*	145	103	20	2.3+-0.1	187+- 14	1.8+-1.0	98+- 16	2.6+-0.4	-1.4+-0.7	91+- 67	355+- 68
40°30'N.	174	119	1	1.3+-0.6	204+- 20	1.2+-0.5	92+- 46	1.7+-0.4	-0.7+-0.4	83+- 71	339+- 54
67°49'W.											
LCN	145	243	798	0.9+-0.3	200+- 98	0.9+-0.4	166+- 66	1.3+-0.4	-0.0+-0.2	196+- 87	53+- 21
40°21'N.	145	841	200	0.8+-0.1	69+- 87	1.0+-0.3	40+- 68	1.3+-0.3	-0.2+-0.1	51+- 72	37+- 6
67°40'W.											
NANTUCKET SHOALS											
NANTUCKET LS	738	2	53	8.2+-0.4	159+- 3	5.9+-0.1	66+- 5	8.2+-0.4	-5.8+-0.0	162+- 10	94+- 11
40°37'N.											
69°37'W.											
NSA	60	5	28	0.7+-0.3	60+- 26	4.4+-1.3	357+- 16	4.4	-0.6	358	4
41°31'N.	63	25	8	1.4+-0.5	63+- 20	4.5+-1.2	357+- 16	4.5	-1.3	359	8
69°36'W.											
NSB	42	10	12	3.4+-0.5	40+- 9	2.9+-0.4	329+- 1	3.7	-2.5	17	58
41°26'N.											
69°44'W.											
NSD	42	16	17	2.3+-1.2	25+- 30	3.2+-1.3	306+- 24	3.3	-2.2	316	15
41°37'N.											
69°44'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - tripod and subsurface mooring were at different depths.
** - Two separate moorings at different depths.

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
POLLOCK RIP 41°37'N. 69°54'W.	369	2	12	0.1	267	1.6	228	1.6	-0.1	228	3
GREAT ROUND 41°24'N. 69°55'W.	87	2.	20	5.2	51	0.2	128	5.2	+0.1	51	90
NSC 41°37'N. 69°59'W.	42	8	8	4.5+-0.9	44+- 12	1.3+-0.5	251+- 21	4.6	-0.6	226	285
I 40°43'N. 70°01'W.	29	18	23	9.0	153	4.9	24	9.6	-3.5	342	293
NSE 40°59'N. 70°04'W.	41	10	12	5.4+-2.2	67+- 23	7.2+-3.7	313+- 30	7.7	-4.6	296	333
NSFE1	172	10	36	11.0+-1.0	159+- 5	10.6+-1.0	45+- 5	12.8	-8.4	10	313
40°41'N. 70°08'W.	222	30	16	7.4+-0.9	169+- 6	5.7+-0.7	55+- 6	8.0	-4.8	7	299
Q	174	10	57	8.7+-0.8	169+- 5	7.4+-0.9	68+- 6	9.0+-0.7	-7.0+-1.0	8+- 8	294+- 8
40°30'N.	464	31	36	7.3+-1.1	173+- 8	5.7+-1.1	70+- 12	7.6+-1.1	-5.3+-1.2	7+- 10	290+- 9
70°13'W.	377	51	16	6.3+-0.9	188+- 9	4.8+-0.7	91+- 16	6.4+-0.8	-4.6+-0.8	12+- 13	277+- 16
	145	57	10	5.4+-1.0	199+- 6	3.5+-0.6	105+- 11	5.4+-1.0	-3.5+-0.5	22+- 4	281+- 11
	116	66	1	3.9+-1.1	185+- 8	2.6+-0.9	78+- 11	4.0+-1.2	-2.4+-0.7	15+- 6	287+- 7
NSFE3	46	10	78	6.2+-4.1	188+- 38	4.4+-3.0	97+- 40	6.2	-4.4	9	271
40°20'N.	209	30	58	5.2+-0.5	178+- 8	3.7+-0.7	82+- 11	5.2	-3.7	4	278
70°16'W.	209	70	18	5.2+-0.9	186+- 10	4.2+-0.9	87+- 12	5.3	-4.1	20	288
NSFE4	170	10	95	6.2+-1.1	178+- 10	5.2+-0.9	87+- 10	6.2	-5.2	1	273
40°13'N.	224	30	75	4.2+-0.7	181+- 9	3.1+-0.9	92+- 16	4.2	-3.1	0	268
70°18'W.	170	60	45	5.7+-0.8	182+- 8	4.5+-0.7	78+- 9	5.9	-4.3	19	293
	224	90	15	5.0+-0.9	186+- 10	4.0+-0.7	100+- 10	5.0	-4.0	359	261
NSFE5*	171	10	188	4.4+-1.3	187+- 15	4.0+-1.5	95+- 22	4.4	-4.0	20	284
40°02'N.	171	30	168	3.5	172	2.5	73	3.5	-2.4	1	283
70°22'W.	171	90	108	3.1+-0.6	188+- 10	2.7+-0.5	93+- 10	3.1	-2.7	23	288
	171	120	78	2.8+-0.5	183+- 11	2.7+-0.5	81+- 11	3.0	-2.5	40	313
	171	185	13	3.2+-0.6	190+- 10	3.0+-0.5	91+- 10	3.4	-2.8	41	306
NSFE6 39°51'N. 70°25'W.	225	10	800	0.9+-0.4	243+- 26	1.1+-0.7	149+- 35	1.1	-0.9	141	351

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* Orientation is questionable

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PARAMETERS PHASE (DEG-G)	ORIEN (DEG-TRUE)
NEW ENGLAND SHELF											
P	87	61	10	4.0+-0.5	189+- 15	3.2+-0.6	104+- 13	4.1+-0.4	-3.2+-0.6	181+- 16	80+- 10
40°29'N. 70°30'W.	58	70	1	2.2+-0.0	183+- 23	1.3+-0.1	106+- 28	2.2+-0.1	-1.2+-0.1	177+- 20	79+- 6
NES743	35	20	85	2.9+-0.6	197+- 12	2.0+-1.2	92+- 34	3.0	-1.9	28	287
40°18'N. 70°52'W.	35	60	45	7.1+-3.1	216+- 25	6.6+-2.8	126+- 25	7.1	-6.6	36	270
NES764	180	305	1995	0.2+-0.2	255+- 56,	0.5+-0.3	118+- 31	0.5	-0.1	114	343
39°37'N. 70°56'W.	180	2005	295	0.4+-0.1	20+- 9	0.2+-0.1	101+- 37	0.4	+0.2	203	264
NES742	35	20	54	4.8+-1.2	196+- 14	2.7+-1.2	95+- 26	4.8	-2.6	21	279
40°35'N. 70°59'W.	35	60	14	6.9+-2.3	217+- 19	5.1+-2.6	128+- 29	6.9	-5.1	36	268
HENS&CHICK 41°27'N. 71°01'W.	369	2	16	1.7	96	0.3	68	1.7	-0.1	95	81
NES763	181	145	351	1.4+-0.3	222+- 13	1.2+-0.3	150+- 13	1.5	-1.1	199	58
39°56'N. 71°03'W.											
NES762	139	38	45	3.7+-0.5	216+- 8	2.6+-0.6	131+- 12	3.7	-2.6	211	83
40°28'N. 71°12'W.	93	73	10	3.7+-0.8	227+- 12	2.7+-0.8	149+- 16	3.8	-2.6	216	74
NES741	35	28	30	4.7+-1.1	202+- 14	2.2+-0.7	101+- 18	4.7	-2.1	25	276
40°56'N. 71°13'W.											
BRENTON REEF 41°26'N. 71°23'W.	369	2	24	0.7	183	2.0	76	2.0	-0.7	74	354
MIDDLE ATLANTIC BIGHT											
NES763W	183	302	202	0.5+-0.2	309+- 23	0.5+-0.2	222+- 22	0.5	-0.5	266	45
39°43'N. 71°47'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
NES762W	172	38	45	3.1+-0.5	267+- 10	2.3+-0.5	191+- 13	3.2	-2.2	254	71
39°55'N. 71°58'W.											
LT5	87	21-H	46	5.8+-0.9	232+- 18	4.2+-1.5	161+- 16	6.4+-1.1	-3.3+-1.3	238+- 45	90+- 41
40°12'N.	70	21-R	46	4.6+-1.5	243+- 29	3.2+-1.2	190+- 22	5.1	-2.3	229	61
72°00'W.	116	41-H	26	3.9+-2.0	255+- 14	2.8+-0.8	189+- 15	4.3+-1.7	-2.2+-1.2	223+- 39	46+- 40
	70	41-R	26	4.7+-1.0	254+- 12	2.7+-0.9	178+- 29	4.8	-2.6	248	79
	87	61-H	6	2.1+-0.3	286+- 9	2.2+-0.1	229+- 0	2.7+-0.2	-1.4+-0.1	254+- 4	42+- 10
	70	61-R	6	2.3+-0.4	284+- 10	2.1+-0.3	228+- 9	2.8	-1.5	260	50
	87	66-H	1	1.3+-0.3	273+- 38	1.3+-0.6	232+- 6	1.7+-0.5	-0.7+-0.6	246+- 17	43+- 16
	70	66-R	1	1.6+-0.3	295+- 11	1.7+-0.3	237+- 9	2.0	-1.1	263	42
LT4	29	3	49	5.8+-0.6	191+- 30	3.3+-0.2	81+- 66	6.1+-0.2	-2.7+-0.7	195+-107	102+- 23
40°34'N.	203	24	28	5.9+-2.0	245+- 10	2.3+-0.8	214+- 50	6.1+-1.9	-1.0+-1.8	246+- 11	73+- 10
72°19'W.	174	44	8	3.4+-1.2	253+- 21	2.0+-1.3	225+- 48	3.8+-1.4	-0.8+-1.5	250+- 23	64+- 11
	87	51	1	1.9+-0.4	271+- 3	1.4+-0.4	242+- 10	2.3+-0.5	-0.6+-0.4	261+- 1	56+- 0
CMICE	25	4	25	3.4+-1.1	248+- 18	1.5+-1.4	172+- 56	3.4	-1.4	245	83
40°47'N.	25	8	21	3.8+-1.0	249+- 14	1.2+-1.2	151+- 57	3.8	-1.2	250	93
72°29'W.	25	16	13	2.6+-1.1	223+- 24	0.7+-0.6	37+- 48	2.7	+0.1	223	105
	25	25	4	0.5+-0.2	208+- 32	1.7+-0.7	332+- 28	1.7	+0.4	334	350
ME	29	59	1	1.6	268	0.5	176	1.6	-0.5	88	271
39°57'N. 72°36'W.											
NJ4	72	3	89	2.2+-1.4	208+- 37	2.5+-1.1	118+- 26	2.5	-2.2	118	0
38°55'N.	72	43	49	0.9+-0.3	7+- 21	0.7+-0.2	331+- 18	1.1	-0.3	354	54
72°58'W.	72	91	1	0.2+-0.0	67+- 11	0.4+-0.1	50+- 10	0.4	-0.1	53	26
MA	58	58	1	0.5+-0.1	209+-120	0.6+-0.2	356+- 60	0.7+-0.0	-0.1+-0.4	351+- 69	26+- 33
39°27'N. 73°00'W.											
LT3	104	9	61	1.5+-0.8	90+- 30	1.5+-0.5	24+- 18	1.8	-1.2	57	45
39°16'N.	104	19	51	1.3+-0.8	77+- 34	2.2+-0.7	7+- 18	2.3	-1.2	16	16
73°02'W.	70	58	12	0.7+-0.3	60+- 23	1.2+-0.2	354+- 10	1.2	-0.6	3	18
MESA7	107	18	50a	0.8+-0.6	244+- 45	1.0+-0.3	8+- 18	1.1	+0.6	27	326
39°55'N.	103	38	30a	0.8+-0.4	277+- 30	1.7+-0.8	246+- 28	1.8	-0.4	251	23
73°06'W.	63	66	2a	0.4+-0.2	253+- 30	0.4+-0.1	352+- 10	0.4	+0.4	33	315
FIRE IS.	369	2	27	2.2	244	0.8	171	2.2	-0.8	242	83
40°29'N. 73°11'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H - harmonic analysis R - response analysis
a - water depth taken from chart 13200

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
MF	116	15	219	3.3+-1.1	211+- 79	3.3+-1.3	98+- 73	4.0+-1.4	-2.3+-0.8	79+- 61	327+- 30
38°31'N.	116	232	2	0.5+-0.2	50+- 88	0.5+-0.1	350+- 88	0.7+-0.1	+0.0+-0.2	3+- 86	42+- 23
73°14'W.											
MC	29	79	1	0.8	126	1.3	58	1.3	-0.7	69	20
38°33'N.											
73°31'W.											
MB	406	15	45	2.1+-1.1	74+- 50	2.2+-1.0	23+- 37	2.7+-1.0	-1.4+-1.1	39+- 31	58+- 74
38°44'N.	58	45	15	1.3+-0.3	46+-. 1	1.3+-0.0	353+- 4	1.7+-0.2	-0.8+-0.1	19+- 9	44+- 14
73°38'W.	522	50	10	0.9+-0.5	118+- 55	1.5+-0.7	55+- 34	1.6+-0.7	-0.8+-0.5	58+- 27	89+- 22
	58	54	6	0.4+-0.1	80+- 38	0.9+-0.1	37+- 4	0.9+-0.1	-0.2+-0.2	40+- 3	15+- 9
	87	59	1	0.9+-0.6	94+- 70	0.8+-0.6	46+- 11	1.2+-0.7	-0.1+-0.1	36+- 33	123+- 72
LT2	116-c	3	31	3.4+-2.9	250+- 82	2.5+-1.3	81+- 64	4.1+-2.3	-1.5+-1.5	51+- 83	13+- 67
39°24'N.	232	15	19	2.8+-1.5	358+- 93	3.1+-1.3	359+- 49	4.1+-1.8	-0.7+-1.1	3+- 47	24+- 43
73°43'W.											
BARNEGAT	369	2	22	0.5	287	0.7	335	0.8	+0.3	318	35
39°46'N.											
73°56'W.											
MD	116	40	1	0.7+-0.2	287+- 50	0.9+-0.5	47+- 25	1.1+-0.3	+0.2+-0.3	26+- 51	18+- 55
38°59'N.											
74°02'W.											
L.EGG INLET	264	5	7	2.4	334	2.6	334	3.5	+0.0	334	43
39°28'N.	365	10	2	1.7	335	2.3	318	2.8	-0.4	324	36
74°15'W.											
NE END L.S.	369	2	24	0.6	213	1.7	85	1.7	-0.5	81	346
38°58'N.											
74°30'W.											
SOUTHERN MID-ATLANTIC BIGHT											
WINTER QU	369	2	22	1.1	186	2.0	124	2.0	-0.9	132	18
37°55'N.											
74°56'W.											
MAB	53	9	29	1.8+-0.9	287+- 29	3.6+-1.8	197+- 28	3.6	-1.8	197	0
36°50'N.	52	21	17	4.7+-3.1	322+- 38	4.6+-2.7	240+- 34	5.0	-4.3	285	49
75°02'W.	53	32	6	0.9+-0.5	328+- 31	1.7+-0.4	193+- 13	1.8	-0.6	185	337
DIAMOND	738	2	51	1.2+-0.4	75+- 4	1.0+-0.0	112+- 26	1.5+-0.2	+0.5+-0.3	88+- 5	52+- 14
35°05'N.											
75°20'W.											
CHESAPEAKE	369	2	17	2.6	288	2.3	186	2.7	-2.2	135	303
36°59'N.											
75°42'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c - average of 4 records @ 31,31,32, and 29 meters above bottom

Table 8. K_1 tidal current parameters—Continued

Table 8. K1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
OCEANIC											
S8	415	70	2470	0.5+-0.1	98+- 44	0.2+-0.1	318+- 27	0.6+-0.1	-0.1+-0.1	282+- 39	285+- 7
42°00'N.	415	1500	1040	0.1+-0.1	52+- 2	0.1+-0.1	219+- 16	0.2+-0.1	+0.0+-0.0	225+- 9	315+- 0
63°30'W.	96	2530	10	0.2	144	0.3	246	0.3	+0.2	255	347
NES765	180	1995	655	0.2+-0.0	8+- 12	0.1+-0.0	110+- 16	0.2	+0.1	184	278
39°17'N.											
70°50'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 9. O_1 tidal current parameters (see table 5 for explanation).

Table 9. O1 TIDAL CURRENT PARAMETERS

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF											
SS10	32	200	1400	0.3	311	0.5	131	0.6	+0.0	131	329
43°34'N. 59°04'W.	22	500	1100	0.2	282	0.2	211	0.2	-0.2	247	45
SS2A	35	555	245	0.2	318	0.2	108	0.3	+0.1	123	315
42°52'N. 62°00'W.											
SS8	36	1500	50	0.4	317	0.1	113	0.4	+0.0	136	283
42°37'N. 62°05'W.											
SS1A	35	290	260	0.6	218	0.2	144	0.6	-0.2	36	264
42°52'N. 62°14'W.	35	490	60	0.4	255	0.3	110	0.5	-0.1	87	305
SS3	238	20	79	5.8+-0.7	216+- 30	3.8+-0.5	153+- 13	6.3+-0.4	-3.0+-1.0	207+- 32	69+- 12
43°22'N.	149	50	49	5.9+-1.3	215+- 5	4.3+-0.7	142+- 1	6.2+-1.3	-3.9+-0.6	200+- 9	68+- 8
62°40'W.	47	81	18	4.5	237	3.4	177	5.0	-2.7	220	60
	15	91	8	5.5	279	3.7	221	6.0	-2.9	266	64
	136	95	4	3.2+-1.1	245+- 12	3.2+-1.0	197+- 13	4.1+-1.3	-1.8+-0.7	221+- 14	45+- 2
SS7	27	50	75	6.8	221	4.4	154	7.1	-3.9	210	70
43°02'N. 62°54'W.	27	118	7	3.5	256	3.6	199	4.4	-2.4	226	44
SS2	189	20	258	4.3+-0.9	223+- 40	2.3+-0.5	198+- 42	4.8+-0.8	-0.9+-0.7	219+- 42	64+- 7
43°45'N.	283	50	228	4.5+-0.6	240+- 7	2.2+-0.2	225+- 47	5.0+-0.5	-0.4+-0.9	239+- 79	53+- 65
62°59'W.	166	95	183	3.4+-0.6	239+- 9	2.1+-0.8	263+- 2	3.9+-0.9	+0.7+-0.2	245+- 8	60+- 7
	272	250	28	2.5+-0.5	261+- 14	3.4+-0.6	280+- 5	4.2+-0.8	+0.6+-0.3	273+- 8	36+- 1
SS6	26	50	85	3.9	251	1.7	202	4.1	-1.2	246	72
43°15'N. 63°22'W.	27	130	5	2.4	249	2.4	250	3.4	+0.0	250	45
SS1	211	14	87	5.8+-0.8	220+- 88	2.3+-0.3	182+- 76	6.2+-0.7	-0.5+-0.6	215+- 90	69+- 5
44°26'N. 63°29'W.	187	95	6	1.2+-0.6	21+- 92	2.7+-1.2	269+- 70	2.9+-1.0	-0.0+-1.1	241+- 60	337+- 36
S5	262	50	1470	0.6+-0.0	238+- 6	0.7+-0.3	166+- 11	0.8+-0.3	-0.5+-0.0	208+- 31	50+- 36
42°30'N.	262	150	1370	0.4+-0.0	283+- 38	0.3+-0.1	154+- 20	0.5+-0.1	-0.2+-0.0	116+- 47	300+- 21
63°30'W.	370	1534	10	0.3	26	0.2	172	0.3	+0.1	196	302

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
SS5	14	150	1575	0.4	336	0.3	196	0.5	-0.2	169	305
42°35'N.											
63°30'W.											
SS4	94	20	1000	2.6+-0.4	262+- 6	1.9+-0.5	176+- 9	2.7+-0.4	-1.9+-0.5	256+- 1	83+- 7
42°40'N.	585	50	970	1.7+-0.1	252+- 31	1.4+-0.1	161+- 15	1.8+-0.2	-1.4+-0.1	161+- 67	359+- 91
63°30'W.	204	100	920	1.0	304	1.0	197	1.1	-0.9	161	315
	663	150	870	1.3+-0.3	286+- 9	1.1+-0.1	181+- 10	1.4+-0.3	-1.0+-0.1	134+- 9	305+- 12
	363	500	520	0.5+-0.1	28+- 98	0.5+-0.2	236+- 83	0.7+-0.2	+0.2+-0.2	237+- 93	311+- 11
	210	690	330	0.3+-0.2	29+- 16	0.2+-0.2	191+- 16	0.4+-0.0	+0.0+-0.0	202+- 7	305+- 31
	296	990	30	0.7+-0.3	9+- 38	0.4+-0.1	179+- 85	0.8+-0.3	+0.0+-0.1	164+- 79	317+- 56
S3	371	230	480	1.5	259	1.1	154	1.5	-1.0	94	292
42°45'N.	97	500	210	0.9	9	0.5	186	1.1	+0.0	188	300
63°30'W.	262	690	20	1.0	22	0.3	184	1.0	+0.1	200	289
S1	266	20	220	3.7+-0.2	249+- 17	2.9+-0.4	167+- 13	3.8+-0.2	-2.8+-0.4	202+- 81	55+- 92
42°49'N.	752	50	190	3.5+-0.3	250+- 5	2.0+-0.1	176+- 16	3.6+-0.4	-1.8+-0.3	245+- 8	80+- 10
63°30'W.	180	100	140	3.8	275	2.4	169	3.9	-2.3	104	285
	632	150	90	3.9+-0.0	252+- 17	2.3+-0.1	159+- 21	3.9+-0.0	-2.2+-0.1	73+- 16	273+- 3
	572	230	10	4.1+-0.4	257+- 19	2.7+-0.1	195+- 19	4.4+-0.4	-2.2+-0.1	245+- 20	67+- 1
S6	250	20	150	5.4	251	3.2	170	5.4	-3.1	247	82
43°00'N.	492	50	120	4.5+-0.8	260+- 14	2.0+-0.2	204+- 13	4.7+-0.8	-1.6+-0.1	254+- 17	73+- 6
63°30'W.	182	100	70	4.1	268	2.4	197	4.2	-2.2	260	75
	380	153	17	3.4+-0.1	270+- 16	1.6+-0.1	214+- 16	3.6+-0.1	-1.3+-0.1	264+- 16	73+- 0
SS13	43	14	84	3.1	247	2.0	193	3.4	-1.5	235	64
44°17'N.	52	89	9	1.8	235	1.4	253	2.3	+0.3	242	53
63°46'W.	43	95	3	2.1	220	2.4	257	3.0	+1.0	241	40
SS12	69	14	46	1.6+-1.3	193+- 20	1.4+-0.7	197+- 24	2.2+-1.5	0.0+-0.0	195+- 23	46+- 11
44°25'N.	70	20	40	2.1	214	0.6	212	2.2	-0.0	214	74
63°57'W.	43	54	6	0.4	32	0.1	208	0.4	+0.0	212	284
S2	84	30	210	4.8	253	4.5	184	5.4	-3.8	223	50
42°46'N.	334	50	190	5.8+-0.2	286+- 20	3.6+-0.5	207+- 21	5.8+-0.2	-3.5+-0.4	279+- 16	79+- 5
64°00'W.	247	220	20	2.4+-0.5	17+- 17	1.3+-0.7	243+- 37	2.7+-0.1	-0.7+-0.1	205+- 10	294+- 22
S7	338	230	480	0.7	339	0.8	205	1.0	-0.4	186	321
42°42'N.	311	690	20	0.4+-0.0	114+- 1	0.4+-0.1	257+- 18	0.6+-0.1	+0.2+-0.1	274+- 7	318+- 5
64°02'W.											
C5	170	15	45	2.7+-1.4	225+- 29	1.1+-0.7	95+- 34	2.8	-0.8	50	286
43°34'N.	174	30	30	5.9	171	3.0	30	6.4	-1.7	358	293
65°06'W.	173	50	10	4.5	351	0.7	30	4.5	+0.5	351	83

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF--CONT.											
C1	162	15	45	6.1+-1.2	276+- 11	1.5+-0.4	210+- 17	6.2	-1.4	274	84
43°11'N.	162	30	30	5.8+-1.0	272+- 10	3.0+-0.9	130+- 17	6.3	-1.7	279	114
65°43'W.	174	50	10	4.6+-0.7	290+- 8	0.7+-0.1	285+- 11	4.7	-0.1	290	81
C3	161	15	95	4.9+-0.9	311+- 11	1.9+-0.4	250+- 10	5.0	-1.6	308	79
42°50'N.	103	50	60	5.4+-0.5	315+- 6	4.9+-0.8	146+- 10	7.3	-0.7	319	132
65°50'W.	161	100	10	3.6+-0.7	308+- 11	1.2+-0.3	303+- 12	3.8	-0.1	307	72
NORTHEAST CHANNEL											
NEC1	174	103	120	2.7+-0.6	301+- 24	1.7+-0.9	309+- 24	3.3+-0.3	+0.2+-0.5	303+- 18	58+- 19
42°20'N.	174	153	70	2.4+-0.4	270+- 23	1.5+-0.6	354+- 47	2.5+-0.4	+1.2+-0.5	282+- 26	64+- 39
65°55'W.	174	207	16	2.4+-0.3	263+- 14	1.9+-0.5	334+- 24	2.6+-0.4	+1.4+-0.4	272+- 22	72+- 24
NEC2*	58	106	134	2.8+-1.2	295+- 19	1.4+-0.8	316+- 8	3.1+-1.4	+0.3+-0.3	298+- 16	66+- 6
42°18'N.	174	156	84	2.3+-0.5	267+- 10	1.5+-0.3	352+- 30	2.4+-0.5	+1.3+-0.3	270+- 17	85+- 23
65°58'W.	58	217	17	2.0+-0.6	231+- 14	2.3+-1.5	338+- 17	3.0+-0.8	+1.2+-0.0	206+- 47	125+- 53
NEC3*	87	112	116	1.3+-0.6	289+- 25	0.9+-0.2	20+- 29	1.4+-0.5	+0.6+-0.4	287+- 40	90+- 41
42°11'N.	87	162	66	2.1+-0.5	266+- 13	0.5+-0.1	73+- 31	2.1+-0.5	+0.1+-0.2	266+- 12	101+- 6
66°02'W.	174	220	16	1.3+-0.6	262+- 40	0.7+-0.3	20+- 47	1.4+-0.6	+0.3+-0.2	262+- 46	101+- 26
GULF OF MAINE											
CASHES LEDGE	58	33	157	1.4	334	0.3	106	1.4	+0.2	333	98
43°11'N.	58	68	122	0.5+-0.2	342+- 32	0.3+-0.3	22+- 52	0.6	+0.2	351	62
69°05'W.	58	180	10	0.7+-0.3	310+- 26	0.2+-0.1	73+- 32	0.7	+0.2	308	99
MONHEGAN	57	33	65	0.7	339	0.2	261	0.7	-0.2	338	86
43°40'N. 69°23'W.	58	68	30	0.3+-0.1	4+- 11	0.2+-0.8	154+- 27	0.4	+0.1	355	122
C.PORPOISE	74	33	65	0.3+-0.1	231+- 24	0.6+-0.3	18+- 27	0.7	+0.1	304	156
43°13'N. 70°17'W.	74	68	30	0.4+-0.2	349+- 35	0.3+-0.2	326+- 34	0.5	-0.1	341	54
BOSTON L.S. 42°20'N. 70°45'W.	369	2	31	0.4	310	0.1	166	0.4	+0.0	311	97
BAY OF FUNDY											
BED65 45°08'N. 65°08'W.	29c	25	37a	1.4	86	0.9	77	1.6	-0.1	83	58
BED66 45°25'N. 65°07'W.	29c	25	13a	1.4	84	0.5	86	1.5	+0.0	84	71

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Data is from two separate moorings at different times.

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	EAST PHASE (DEG-G)	NORTH (CM/SEC)	NORTH PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GULF OF MAINE--CONT.											
BED64	29c	10	40a	1.6	94	1.1	111	1.9	+0.3	100	55
45°13'N.	29c	25	25a	1.5	97	0.9	101	1.8	+0.0	98	59
65°14'W.											
BED63	29c	25	25a	1.1	85	0.8	92	1.4	+0.1	88	54
45°19'N.											
65°20'W.											
BED62	29c	13	77b	1.3	147	1.0	134	1.7	-0.2	142	52
44°39'N.											
66°02'W.											
BED61	29c	13	94b	1.1	73	0.6	105	1.2	+0.3	78	66
44°49'N.	29c	50	57b	1.2	86	0.6	105	1.3	+0.2	90	63
66°12'W.											
BED60	29c	13	71b	0.4	114	0.2	292	0.5	+0.0	114	117
45°00'N.											
66°24'W.											
GEORGES BANK											
L	145	51	15	1.6+-0.5	110+- 12	2.5+-0.6	28+- 13	2.6+-0.6	-1.5+-0.5	33+- 21	9+- 15
41°42'N.											
66°36'W.											
P4	29	79	140	1.2	294	0.9	15	1.2	+0.9	305	75
42°12'N.	29	129	90	2.1	276	0.9	21	2.1	+0.8	274	97
66°41'W.											
P5	29	19	52	0.8	82	3.2	46	3.3	-0.5	48	12
42°02'N.	29	44	27	1.2	277	1.8	18	1.8	+1.2	26	347
66°41'W.											
P6	58	11	59	0.3+-0.2	224+-122	1.6+-0.4	7+- 1	1.6+-0.4	-0.1+-0.3	5+- 4	354+- 11
41°53'N.	58	26	44	0.2+-0.0	64+- 13	1.8+-0.5	20+- 4	1.8+-0.5	-0.1+-0.1	21+- 4	5+- 1
66°41'W.	58	36	34	0.4+-0.0	109+- 30	1.8+-0.4	37+- 3	1.9+-0.4	-0.4+-0.1	37+- 4	3+- 7
M4*	58	10	67	2.1	129	0.2	55	2.1	-0.2	129	89
40°56'N.	58	36	41	2.6	169	2.1	100	2.8	-1.8	151	62
66°58'W.	58	69	8	0.8	183	1.9	92	1.9	-0.8	92	0
P1	15	30	173	3.1	345	0.9	176	3.2	-0.2	346	106
42°12'N.	15	40	163	2.9	348	0.7	271	2.9	-0.7	347	87
67°15'W.	15	75	128	1.5	323	0.7	321	1.7	-0.0	323	65

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
a - water depth estimated from DMA chart 14040 (old 609)
b - water depth estimated from DMA chart 13102
c - estimated to be at least 29-days
* - depths have been calculated from the mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GEORGES BANK--CONT.											
P2	30	14	36	1.7+-0.0	321+- 10	1.6+-0.4	319+- 4	2.3+-0.3	-0.1+-0.1	320+- 7	47+- 7
42°03'N.	15	30	20	1.6	323	0.8	347	1.8	+0.3	327	66
67°15'W.											
P3	15	15	30	2.3	305	1.0	252	2.4	-0.6	300	73
41°53'N.	15	30	15	1.5	307	1.2	312	1.9	+0.1	309	52
67°15'W.	15	40	5	5.8	224	1.8	142	5.8	-1.7	223	87
M3*	58	36	8	2.2	245	2.4	163	2.5	-2.1	189	30
41°20'N.											
67°16'W.											
M9*	58	71	8	0.6	128	1.0	78	1.1	-0.4	86	22
40°54'N.											
67°24'W.											
A	261	15	70	1.8+-0.9	140+- 53	1.9+-0.7	54+- 31	2.4+-1.0	-1.1+-0.7	68+- 41	7+- 49
40°51'N.	957	45	40	1.6+-0.6	130+- 33	1.5+-0.5	59+- 31	1.9+-0.6	-1.2+-0.5	100+- 41	66+- 66
67°24'W.	957	75	10	1.3+-0.4	131+- 36	1.2+-0.5	69+- 33	1.6+-0.4	-0.8+-0.5	96+- 51	39+- 50
	290	84	1	1.0+-0.3	121+- 28	1.1+-0.4	61+- 17	1.3+-0.4	-0.7+-0.3	89+- 22	43+- 10
C	116	15	23	1.7+-0.4	78+- 6	2.3+-0.3	28+- 3	2.6+-0.3	-1.1+-0.2	43+- 4	32+- 9
41°24'N.											
67°34'W.											
K**	58	10	54	1.3+-0.5	128+- 15	1.7+-0.8	56+- 2	2.0+-0.4	-0.9+-0.2	98+- 51	49+- 49
41°04'N.	174	15	45	1.8+-1.1	110+- 24	1.7+-1.1	58+- 43	2.2+-1.0	-1.1+-1.1	96+- 20	57+- 26
67°34'W.	58	34	30	1.3+-0.5	128+- 15	1.7+-0.8	56+- 2	2.0+-0.4	-0.9+-0.2	98+- 51	49+- 49
	174	54	10	1.7+-0.5	141+- 18	1.9+-0.3	66+- 10	2.1+-0.4	-1.4+-0.3	94+- 36	34+- 26
	87	58	4	1.4+-0.3	140+- 30	1.4+-0.1	75+- 25	1.7+-0.2	-1.1+-0.2	105+- 22	42+- 9
	232	60	1	1.5+-0.5	130+- 18	1.5+-0.5	53+- 19	1.7+-0.5	-1.3+-0.5	95+- 36	54+- 33
D	87	15	69	1.4+-0.2	354+- 10	1.4+-0.4	354+- 11	2.0+-0.3	-0.2+-0.3	352+- 8	45+- 11
41°59'N.											
67°47'W.											
GREAT SOUTH CHANNEL											
M	145	10-H	56	2.1+-0.9	119+- 23	6.0+-0.9	73+- 10	6.2+-0.8	-1.4+-0.8	77+- 11	15+- 7
40°51'N.	171	10-R	56	2.0+-0.4	118+- 11	5.6+-0.6	72+- 6	5.8	-1.4	76	15
68°49'W.	116	51-H	15	2.3+-0.7	112+- 22	5.1+-0.3	63+- 12	5.4+-0.1	-1.6+-0.7	69+- 15	19+- 7
	124	51-R	15	2.1+-0.4	116+- 10	4.8+-0.6	64+- 7	5.0	-1.6	70	17
B	87	58	20	2.4+-0.5	100+- 11	4.6+-0.9	62+- 6	5.0+-1.0	-1.4+-0.7	69+- 3	23+- 1
40°49'N.											
69°00'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - depths have been calculated from the mean pressure and error estimates are taken from across-isobath and along-isobath directions since these are nearly the same as the ellipse axis. These records span identical time periods.
**- tripod and subsurface moorings were at different depths.

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR ABOVE DEPTH (M)	BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
GREAT SOUTH CHANNEL-CONT.											
GSC2	109	10	73	3.5+-0.8	102+- 14	6.6+-1.1	77+- 9	7.4	-1.3	82	27
40°51'N.	152	42	41	3.2+-0.5	96+- 10	6.4+-0.6	80+- 6	7.1	-0.8	83	26
69°01'W.	152	76	7	3.1+-0.5	273+- 10	7.1+-1.2	295+- 9	7.7	+1.1	292	23
N	145	68	15	2.4+-0.8	106+- 19	3.6+-1.0	74+- 6	4.2+-1.2	-1.1+-0.5	33+- 11	31+- 5
40°51'N. 69°01'W.											
R	116	79	1	2.1+-0.8	113+- 23	1.6+-0.3	68+- 28	2.5+-0.6	-0.9+-0.3	97+- 18	52+- 18
40°30'N. 69°07'W.											
GSC1	149	27	37	3.9+-0.5	81+- 7	5.6+-0.6	80+- 6	6.8	-0.1	80	35
40°52'N.	149	49	15	3.9+-0.5	80+- 7	4.0+-0.5	79+- 7	5.6	-0.0	80	44
69°11'W.											
LYDONIA CANYON*											
LCA	116	80	20	2.0+-0.9	126+- 25	1.8+-0.6	45+- 26	2.1+-0.9	-1.7+-0.6	103+- 17	63+- 20
40°34'N.	58	99	1	1.0+-0.0	178+- 0	1.0+-0.2	107+- 4	1.1+-0.1	-0.8+-0.1	144+- 17	48+- 16
67°45'W.											
LCB	145	92	190	1.5+-0.5	135+- 22	1.5+-0.3	29+- 40	1.8+-0.5	-1.1+-0.3	344+- 64	319+- 36
40°32'N.	145	227	55	0.4+-0.2	202+- 42	0.4+-0.3	126+- 80	0.6+-0.2	-0.1+-0.2	128+- 81	8+- 57
67°43'W.	116	277	5	0.5+-0.2	348+- 94	0.3+-0.4	33+- 71	0.6+-0.4	+0.0+-0.1	27+- 77	8+- 75
LCC	116	134	50	1.0+-0.4	131+- 62	0.8+-0.5	74+- 31	1.2+-0.6	-0.3+-0.3	80+- 47	35+- 60
40°29'N. 67°44'W.											
LCD	116	143	50	1.0+-0.7	123+- 18	0.6+-0.5	17+- 36	1.0+-0.7	-0.4+-0.4	351+- 75	21+- 67
40°29'N. 67°41'W.											
LCE	145	116	484	1.4+-0.5	111+- 36	1.3+-0.6	23+- 65	1.7+-0.8	-0.8+-0.5	77+- 92	18+- 55
40°25'N.	145	216	384	0.4+-0.2	113+-118	1.2+-0.6	89+- 78	1.2+-0.6	-0.2+-0.3	89+- 78	6+- 18
67°40'W.	145	595	5	0.5+-0.4	45+- 81	1.3+-0.8	42+-101	1.4+-0.9	+0.2+-0.3	36+-102	16+- 10
LCF	145	205	300	0.8+-0.5	52+- 11	0.7+-0.4	73+- 53	1.0+-0.5	-0.0+-0.5	60+- 33	45+- 17
40°21'N.	174	405	100	0.6+-0.4	120+- 45	0.5+-0.2	126+- 72	0.7+-0.4	+0.1+-0.4	126+- 63	47+- 25
67°39'W.											
LCG	174	195	300	0.7+-0.4	148+- 81	0.6+-0.3	147+- 89	0.9+-0.4	-0.1+-0.4	144+- 84	50+- 17
40°21'N.	174	395	100	0.4+-0.1	58+- 50	0.4+-0.3	7+- 98	0.6+-0.2	-0.0+-0.1	14+- 98	16+- 65
67°42'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* - Observations from stations LCB(except 277m),LCE,LCH(except 1375 and 1454m),LCK,LCJ(except 454m), and LCN all begin at 0100 on Dec. 2, 1980 and end at 0100 on April 26, 1981. Observations at LCA(80m),LCB(277m),LCJ(83m),LCK(454m) and LCL begin at 0100 on Dec. 2, 1980 but end 29 days earlier on March 28, 1981.

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
LYDONIA CANYON--CONT.											
LCH*	145	290	1264	0.8+-0.5	200+- 64	0.8+-0.1	32+-100	1.2+-0.3	-0.3+-0.2	19+- 82	325+- 31
40°18'N.	145	540	1014	0.6+-0.3	228+- 67	0.5+-0.4	106+- 73	0.7+-0.4	-0.1+-0.4	101+- 65	357+- 56
67°40'W.	145	890	664	0.2+-0.1	98+- 78	0.5+-0.2	316+- 83	0.5+-0.2	-0.1+-0.1	318+- 87	347+- 15
	29	1454	100	0.2	176	0.3	285	0.3	+0.1	294	344
	87	1375	5	0.3+-0.2	168+- 93	0.4+-0.3	100+- 76	0.5+-0.3	+0.2+-0.2	101+- 82	26+- 9
LCI	145	10	240	2.0+-1.1	102+- 80	1.5+-0.9	329+- 68	2.6+-0.9	-0.4+-0.3	311+- 90	23+- 59
40°23'N.	145	55	195	1.1+-0.6	80+- 87	1.1+-0.5	63+- 72	1.5+-0.5	-0.3+-0.5	94+- 68	23+- 56
67°33'W.	145	195	55	0.8+-0.2	150+- 55	0.7+-0.4	39+- 56	1.0+-0.3	-0.3+-0.3	12+- 66	331+- 56
	145	245	5	0.6+-0.4	18+- 89	0.6+-0.5	71+- 59	0.8+-0.5	+0.1+-0.4	58+- 80	48+- 29
LCJ	116	83	488	1.2+-0.4	127+- 66	1.0+-0.6	332+- 66	1.6+-0.3	+0.2+-0.4	342+- 49	313+- 42
40°21'N.	145	223	348	0.6+-0.5	156+- 81	0.5+-0.2	42+- 42	0.8+-0.4	-0.1+-0.1	28+- 59	321+- 34
67°32'W.	145	471	100	0.6+-0.3	195+- 76	0.4+-0.3	75+- 66	0.7+-0.3	-0.1+-0.2	136+-104	3+- 70
LCK	145	204	350	0.5+-0.4	137+- 64	0.4+-0.4	50+- 74	0.6+-0.5	-0.2+-0.3	36+- 67	332+- 52
40°16'N.	145	454	100	0.9+-0.5	271+- 65	0.7+-0.2	306+- 71	1.1+-0.4	-0.1+-0.4	297+- 55	42+- 40
67°47'W.											
LCL	116	65	60	2.0+-0.1	115+- 38	1.7+-0.7	45+- 24	2.3+-0.4	-1.3+-0.4	62+- 47	35+- 59
40°32'N.	116	105	20	1.4+-0.5	139+- 59	1.5+-0.5	71+- 36	1.9+-0.3	-0.9+-0.7	84+- 45	23+- 39
67°36'W.											
LCM**	145	103	20	1.5+-0.6	128+- 20	1.3+-0.5	45+- 44	1.8+-0.4	-0.9+-0.6	89+- 81	24+- 65
40°30'N.	174	119	1	0.9+-0.5	148+- 45	1.3+-0.7	74+- 34	1.5+-0.5	-0.6+-0.6	86+- 33	22+- 36
67°49'W.											
LCN	145	243	798	1.0+-0.4	54+- 84	0.6+-0.2	87+- 89	1.1+-0.3	-0.2+-0.4	69+-100	32+- 73
40°21'N.	145	841	200	0.4+-0.3	299+- 76	0.5+-0.3	328+- 70	0.7+-0.3	+0.1+-0.1	327+- 67	27+- 28
67°40'W.											
NANTUCKET SHOALS											
NANTUCKET LS	738	2	53	5.7+-0.5	123+- 2	3.9+-1.2	26+- 1	5.7+-0.6	-3.9+-1.1	310+- 7	280+- 6
40°37'N.											
69°37'W.											
NSA	60	5	28	1.9+-0.9	63+- 26	6.4+-1.8	3+- 16	6.5	-1.6	5	9
41°31'N.	63	25	8	1.2+-0.4	35+- 30	1.8+-0.5	339+- 16	2.0	-0.9	352	27
69°36'W.											
NSB	42	10	12	2.4+-0.4	24+- 9	1.1+-0.2	333+- 8	2.5	-0.8	18	72
41°26'N.											
69°44'W.											
NSD	42	16	17	0.6+-0.3	274+- 30	0.5+-0.2	187+- 24	0.6	-0.5	267	82
41°37'N.											
69°44'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Tables 3.
If UMINOR < 0, ellipse rotates clockwise
* - two separate moorings at different depths
** - tripod and subsurface mooring were at different depths

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NANTUCKET SHOALS--CONT.											
POLLOCK RIP 41°37'N. 69°54'W.	369	2	12	0.4	57	0.5	183	0.5	+0.3	202	325
GREAT ROUND 41°24'N. 69°55'W.	87	2	20	5.4	334	0.6	316	5.4	-0.2	334	84
NSC 41°37'N. 69°59'W.	42	8	8	3.9+-0.8	9+- 12	0.9+-0.3	218+- 21	4.0	-0.4	190	282
I 40°43'N. 70°01'W.	29	18	23	3.1	127	1.9	44	3.2	-1.9	122	83
NSE 40°59'N. 70°04'W.	41	10	12	2.7+-1.1	64+- 23	4.6+-2.3	306+- 30	4.8	-2.3	296	340
NSFE1	172	10	36	6.0+-0.6	119+- 5	4.9+-0.5	9+- 6	6.4	-4.3	320	301
40°41'N. 70°08'W.	222	30	16	3.7+-0.4	131+- 7	2.6+-0.3	11+- 7	4.0	-2.1	326	297
Q	174	10	57	4.1+-1.0	130+- 24	3.4+-1.1	30+- 24	4.5+-0.9	-3.0+-1.0	338+- 49	305+- 30
40°30'N.	464	31	36	4.0+-1.0	133+- 13	3.0+-0.8	24+- 14	4.2+-1.0	-2.6+-0.8	328+- 14	293+- 12
70°13'W.	377	51	16	3.5+-1.5	147+- 12	2.5+-1.0	55+- 17	3.6+-1.4	-2.4+-1.1	148+- 24	93+- 27
	145	57	10	3.5+-0.5	156+- 7	2.1+-0.4	59+- 9	3.5+-0.5	-2.1+-0.4	182+- 11	100+- 10
	116	66	1	1.9+-0.7	117+- 15	1.5+-0.4	356+- 12	2.1+-0.5	-1.1+-0.6	318+- 17	304+- 24
NSFE3	46	10	78	3.4+-2.2	143+- 38	2.9+-2.0	54+- 40	3.4	-2.9	140	87
40°20'N.	209	30	58	2.7+-0.4	145+- 8	1.8+-0.3	58+- 11	2.7	-1.8	143	86
70°16'W.	209	70	18	2.4+-0.4	138+- 10	1.8+-0.4	52+- 12	2.4	-1.8	133	83
NSFE4	170	10	95	3.1+-0.5	139+- 10	2.6+-0.5	63+- 10	3.2	-2.4	118	62
40°13'N.	224	30	75	2.5+-0.4	145+- 9	1.6+-0.4	62+- 16	2.5	-1.6	140	83
70°18'W.	170	60	45	3.2+-0.4	128+- 8	2.0+-0.3	44+- 9	3.2	-2.0	124	84
	224	90	15	2.5+-0.4	141+- 10	2.0+-0.4	53+- 10	2.5	-2.0	138	86
NSFE5*	171	10	188	1.8+-0.5	143+- 16	1.5+-0.6	60+- 22	1.8	-1.5	126	70
40°02'N.	171	30	168	1.9	128	1.9	34	2.0	-1.8	185	149
70°22'W.	171	90	108	1.6+-0.3	140+- 10	1.3+-0.2	45+- 11	1.6	-1.3	149	102
	171	120	78	1.6+-0.3	125+- 11	1.4+-0.3	47+- 11	1.7	-1.3	100	59
	171	185	13	1.5+-0.3	128+- 10	1.4+-0.3	52+- 10	1.6	-1.3	95	51
NSFE6 39°51'N. 70°25'W.	225	10	800	1.0+-0.4	207+- 26	1.7+-1.0	68+- 35	1.9	-0.6	59	333

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
* Orientation is questionable

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
NEW ENGLAND SHELF											
P	87	61	10	3.4+-1.5	164+- 29	2.2+-0.5	90+- 31	3.6+-1.5	-1.9+-0.4	153+- 46	70+- 24
40°29'N. 70°30'W.	58	70	1	1.6+-0.3	148+- 40	0.7+-0.2	83+- 10	1.7+-0.3	-0.6+-0.3	144+- 43	79+- 11
NES743	35	20	85	3.3+-0.7	174+- 12	2.5+-1.5	89+- 34	3.3	-2.5	168	81
40°18'N. 70°52'W.	35	60	45	2.5+-1.1	170+- 25	1.5+-0.6	97+- 25	2.6	-1.4	162	76
NES764	180	305	1995	0.2+-0.3	102+- 64	0.5+-0.3	34+- 31	0.5	-0.2	38	10
39°37'N. 70°56'W.	180	2005	295	0.2+-0.0	341+- 9	0.2+-0.1	39+- 37	0.2	+0.1	10	45
NES742	35	20	54	3.8+-0.9	171+- 14	2.8+-1.3	79+- 26	3.8	-2.8	173	93
40°35'N. 70°59'W.	35	60	14	2.5+-0.8	194+- 19	1.0+-0.5	123+- 29	2.5	-0.9	191	81
HENS&CHICK 41°27'N. 71°01'W.	369	2	16	1.0	99	0.4	119	1.1	+0.1	101	71
NES763 39°56'N. 71°03'W.	181	145	351	1.1+-0.2	167+- 13	1.0+-0.2	82+- 13	1.1	-1.0	148	69
NES762	139	38	45	3.1+-0.4	166+- 8	1.7+-0.4	88+- 12	3.1	-1.6	161	81
40°28'N. 71°12'W.	93	73	10	2.6+-0.5	168+- 12	1.6+-0.5	106+- 16	2.7	-1.3	157	69
NES741 40°56'N. 71°13'W.	35	28	30	3.2+-0.8	169+- 14	1.8+-0.6	84+- 18	3.2	-1.8	167	86
BRENTON REEF 41°26'N. 71°23'W.	369	2	24	0.2	167	1.3	98	1.3	-0.2	99	3
MIDDLE ATLANTIC BIGHT											
NES763W 39°43'N. 71°47'W.	183	302	202	0.3+-0.1	198+- 23	0.5+-0.2	134+- 22	0.5	-0.3	144	20

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
NES762W	172	38	45	3.1+-0.5	212+- 10	2.7+-0.6	143+- 12	3.4	-2.3	187	56
39°55'N. 71°58'W.											
LT5	87	21-H	46	2.9+-1.7	203+- 16	3.2+-0.8	138+- 11	3.8+-1.5	-2.1+-0.9	159+- 8	32+- 23
40°12'N.	70	21-R	46	3.0	205	3.0	141	3.6	-2.2	173	45
72°00'W.	116	41-H	26	3.8+-1.1	193+- 10	3.1+-1.3	129+- 32	4.4+-1.5	-2.2+-0.8	165+- 99	34+- 69
	70	41-R	26	3.5	192	3.1	132	4.1	-2.3	168	52
	87	61-H	6	1.9+-0.4	224+- 24	2.1+-0.0	178+- 22	2.6+-0.2	-1.1+-0.1	199+- 17	42+- 8
	70	61-R	6	1.7	234	1.9	182	2.3	-1.1	204	40
	87	66-H	1	1.4+-0.2	232+- 26	1.6+-0.3	183+- 18	1.9+-0.2	-0.8+-0.2	202+- 12	38+- 12
	70	66-R	1	1.2	248	1.6	192	1.8	-0.9	209	31
LT4	29	3	49	1.8+-0.4	169+- 49	1.0+-1.1	225+-112	2.0+-0.6	-0.6+-1.0	158+- 33	76+- 33
40°34'N.	203	24	28	5.4+-1.0	203+- 21	2.3+-1.2	138+- 37	5.7+-1.2	-1.4+-0.9	201+- 23	79+- 16
72°19'W.	174	44	8	3.4+-1.0	217+- 15	1.9+-0.2	180+- 38	3.8+-0.7	-0.9+-0.8	213+- 21	64+- 14
	87	51	1	1.3+-0.4	217+- 6	1.0+-0.1	190+- 2	1.6+-0.4	-0.4+-0.0	206+- 3	52+- 4
CMICE	25	4	25	3.5+-1.0	176+- 18	0.3+-0.3	277+- 58	3.5	+0.3	176	91
40°47'N.	25	8	21	3.3+-0.9	175+- 14	0.3+-0.3	318+- 58	3.3	+0.2	175	94
72°29'W.	25	16	13	3.3+-1.4	167+- 24	1.1+-0.9	12+- 48	3.4	-0.4	169	107
	25	25	4	2.1+-1.1	168+- 32	1.0+-0.5	262+- 27	2.1	+1.0	167	93
ME	29	59	1	2.4	213	1.1	178	2.6	-0.6	208	68
39°57'N. 72°36'W.											
NJ4	72	3	89	3.6+-2.3	325+- 37	3.0+-1.4	255+- 26	3.9	-2.6	303	59
38°55'N.	72	43	49	1.4+-0.5	289+- 21	1.0+-0.3	243+- 18	1.6	-0.6	275	58
72°58'W.	72	91	1	0.1+-0.0	346+- 11	0.1+-0.0	132+- 10	0.1	+0.0	329	135
MA	58	58	1	0.9+-0.0	263+- 28	0.8+-0.0	204+- 33	1.0+-0.1	-0.6+-0.0	240+- 28	53+- 2
39°27'N. 73°00'W.											
LT3	104	9	61	1.2+-0.6	282+- 30	1.5+-0.5	217+- 18	1.6	-1.0	237	31
39°16'N.	104	19	51	2.2+-1.3	279+- 34	1.4+-0.4	206+- 18	2.3	-1.3	270	74
73°02'W.	70	58	12	1.4+-0.5	4+- 22	1.8+-0.3	274+- 10	1.8	-1.4	274	0
MESA7	107	18	50a	2.0+-1.6	243+- 45	2.8+-0.9	177+- 18	3.0	-1.7	192	25
39°55'N.	103	38	30a	1.3+-0.7	233+- 30	1.0+-0.5	206+- 26	1.6	-0.4	223	53
73°06'W.	63	66	2a	0.5+-0.3	226+- 30	0.4+-0.1	301+- 10	0.5	+0.4	244	66
FIRE IS.	369	2	27	1.3	220	0.8	187	1.5	-0.4	211	59
40°29'N. 73°11'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
H - harmonic analysis R - response analysis
a - water depth taken from chart 13200

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
MIDDLE ATLANTIC BIGHT--CONT.											
MF	116	15	219	1.2+-1.2	286+- 30	1.8+-1.2	234+- 86	1.9+-1.1	-0.8+-1.6	226+- 88	102+- 27
38°31'N. 73°14'W.	116	232	2	0.3+-0.1	23+- 96	0.3+-0.1	238+- 88	0.4+-0.1	-0.1+-0.1	259+-101	32+- 51
MC	29	79	1	0.5	53	1.0	304	1.0	-0.5	299	348
38°33'N. 73°31'W.											
MB	406	15	45	2.3+-0.8	312+- 42	2.0+-0.8	257+- 35	2.9+-0.9	-1.1+-0.7	284+- 50	49+- 72
38°44'N.	58	45	15	1.8+-0.2	334+- 7	1.7+-0.1	272+- 33	2.1+-0.3	-1.2+-0.4	298+- 35	40+- 17
73°38'W.	522	50	10	1.4+-0.5	326+- 32	1.5+-0.7	264+- 30	1.8+-0.7	-0.9+-0.4	288+- 31	38+- 74
	58	54	6	1.1+-0.2	10+- 1	1.7+-0.1	300+- 11	1.8+-0.1	-1.0+-0.3	310+- 8	2+- 0
	87	59	1	0.7+-0.2	278+- 92	0.7+-0.3	231+- 44	0.9+-0.2	-0.2+-0.6	194+- 28	340+- 59
LT2	116-c	3	31	2.7+-0.9	266+- 46	2.2+-0.9	220+- 28	3.1+-1.1	-1.3+-0.8	249+- 39	55+- 3
39°24'N.	232	15	19	4.0+-1.4	268+- 25	3.6+-0.8	235+- 20	5.2+-1.4	-1.5+-0.7	253+- 26	47+- 9
73°43'W.											
BARNEGAT	369	2	22	0.5	263	0.9	233	1.0	-0.2	239	26
39°46'N. 73°56'W.											
MD	116	40	1	0.4+-0.4	301+- 96	1.0+-0.4	299+- 26	1.1+-0.4	-0.0+-0.0	298+- 26	7+- 30
38°59'N. 74°02'W.											
L.EGG INLET	264	5	7	2.5	79	2.7	57	3.6	-0.7	67	43
39°28'N.	365	10	2	1.4	68	2.4	63	2.8	-0.1	64	30
74°15'W.											
NE END L.S.	369	2	24	2.1	281	1.1	294	2.3	+0.2	283	63
38°58'N. 74°30'W.											
SOUTHERN MID-ATLANTIC BIGHT											
WINTER QU	369	2	22	1.2	148	1.2	60	1.2	-1.2	97	38
37°55'N. 74°56'W.											
MAB	53	9	29	1.6+-0.8	270+- 29	3.7+-1.8	134+- 28	3.9	-1.1	129	341
36°50'N.	52	21	17	4.0+-2.6	218+- 38	3.6+-2.1	135+- 34	4.1	-3.5	197	65
75°02'W.	53	32	6	0.6+-0.3	47+- 30	0.3+-0.1	171+- 13	0.6	+0.2	220	288
DIAMOND	738	2	51	1.4+-0.7	324+- 57	1.8+-0.3	273+- 34	2.1+-0.0	-0.9+-0.6	299+- 64	41+- 26
35°05'N. 75°20'W.											
CHESAPEAKE	369	2	17	0.6	340	1.1	140	1.3	+0.2	145	332
36°59'N. 75°42'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c - average of 4 records @ 31, 31, 32, and 29 meters above bottom

Table 9. O_1 tidal current parameters—Continued

Table 9. O1 TIDAL CURRENT PARAMETERS--Continued

STATION LAT. LONG.	RECORD LENGTH (DAYS)	INSTR DEPTH (M)	ABOVE BOTTOM (M)	FOURIER COEFFICIENTS EAST (CM/SEC)	PHASE (DEG-G)	NORTH (CM/SEC)	PHASE (DEG-G)	CURRENT ELLIPSE PARAMETERS UMAJOR (CM/SEC)	UMINOR (CM/SEC)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
OCEANIC											
S8	415	70	2470	0.5+-0.4	276+-105	0.5+-0.4	117+- 4	0.6+-0.4	-0.3+-0.6	144+- 24	9+- 51
42°00'N.	415	1500	1040	0.1+-0.1	350+- 5	0.3+-0.1	179+- 6	0.3+-0.1	-0.0+-0.0	176+- 5	330+- 5
63°30'W.	96	2530	10	0.1	335	0.2	150	0.2	-0.0	151	334
NES765	180	1995	655	0.2+-0.1	328+- 12	0.1+-0.0	91+- 16	0.2	+0.1	141	288
39°17'N.											
70°50'W.											

Instrument type, method of analysis and source of data are listed alphabetically by stations in Table 3.
If UMINOR < 0, ellipse rotates clockwise
c - average of 4 records @ 31, 31, 32, and 29 meters above bottom

APPENDIXES I–III

APPENDIX I - INSTRUMENT DESCRIPTION

This appendix is a brief description of the instruments used to make the current or pressure observations listed in this atlas. Use of brand names in this atlas is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey.

Aanderaa Model RCM-4 current meter. Speed sensor is a 6-cup Savonius rotor. Instrument is oriented into the current by a large trailing vane. Rotor count and a single measurement of direction are recorded every 10–20 minutes (Beardsley and others, 1977a).

Braincon Model 316 or 381 current meter. Data recorded on film.

Bubbler Sea level is determined by the back pressure at an oriface to which nitrogen gas or compressed air is supplied. Data is recorded by a Bristol strip chart recorder. Accuracy is ±7.6 cm and ±5 minutes as cited in EG&G (1976). (Redfield, 1962).

C&GS Sea level is measured by a float in a stilling well. Accuracy is estimated at ±5.8 cm and 12 minutes (Goodrich, 1981).

Current pole Current speed is measured by the rate of drift of a 4.6 m wooden pole which floats with 4.3 m below the sea surface. Current direction is determined with a pelorus and compass (Haight, 1941).

Draper Pressure is measured by means of a bonded strain gauge pressure transducer. Accuracy is estimated at ±3–4 cm (Beardsley and others, 1977b).

EG&G Model 850 current meter. Speed sensor is a Savonius rotor and the direction sensor is a small current vane. Both sensors are burst-sampled at a 5 s rate, typically 10 times every 7.5 minutes. (Beardsley and others, 1977a).

Model 102 current meter. Approximately the same instrument as the Model 850, but data is recorded on film.

Endeco Model 105 current meter. Speed sensor is an 8-bladed bi-directional ducted impeller which is oriented into the current by a large leading vane. Direction is recorded on 16 mm film as a time exposure over a measurement interval which is typically 30 minutes. (Beardsley and others, 1977a).

Filloux Tide pressure is measured by means of a Bourdon tube-optical lever transducer. Accuracy is estimated at ±0.5 cm. (Beardsley and others, 1977b).

Fisher-Porter Sea level is measured by a float in a stilling well. Accuracy is ±5.8 cm and 6 minutes (Goodrich, 1981).

Hewlett-Packard Pressure is measured by means of a quartz crystal. Sampling interval is 2 minutes and precision is about 0.1 millibar.

Ottboro Pressure gauge transducers connected to bellows which control a pen on a clock-driven strip chart. Accuracy is estimated to be about 3 percent (Canadian Hydrographic Service, 1966).

Paroscientific Pressure is measured by a quartz-crystal sensor. Accuracy is estimated at ±3.0 millibars (Butman and Folger, 1979).

Photographic Current speed sensor is a paddle-wheel impeller. Counter and compass heading are recorded photographically (Canadian Hydrographic Service, 1966).

RAY Marsh-McBirney two-axis electromagnetic current sensor mounted on a buoy system fabricated by Raytheon Ocean Systems (Lobecker and others, 1978).

USGS tripod Current speed is measured by a Savonius rotor and current direction by a small vane. Sensors are burst sampled at a 4 s rate typically 12 times every 7.5 minutes. Accuracy is estimated at ±1 cm/s and ±5° (Butman and Folger, 1979).

VACM AMF (now EG&G) Model 610 vector averaging current meter. The instrument uses a Savonius rotor speed sensor and a small vane direction sensor. The sensors are sampled continuously and vector-averaged east and north current components are typically recorded every 7.5 or 15.0 minutes.

Vibratron Pressure gauge with taut vibrating wire sensor. Accuracy estimated at ±0.5 cm (Beardsley and others, 1977b and Petrillo, 1981).

APPENDIX II - M_2 BOTTOM CURRENT ESTIMATES

Estimates of the amplitude of the major and minor axis of the M_2 bottom current (table II-1) were determined using the empirical curve in figure 2 and tidal constants at a point within about 30 m of the bottom. The phase and orientation were estimated by adding $-17°$ and $+14°$, respectively, when the measurements were made at depths greater than 15 mab. If the measurements were made at depths less than 15 mab then $-8°$ and $+7°$ were added to the corresponding phase and orientation to give values at 1 mab. The asterisk after a station name indicates actual field measurements at 1 mab and not estimates of bottom current.

Table II-1. M_2 bottom current

Station	Lat. °N.	Long. °W.	UMAJOR (cm/s)	UMINOR (cm/s)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
SCOTIAN SHELF						
SS3	43°22′	62°40′	9	−4	266	342
SS7	43°02′	62°54′	8	−3	254	345
SS6	43°15′	63°22′	8	−2	265	339
SS1	44°26′	63°29′	2	−0	279	244
S8	42°00′	63°30′	1	+0	281	321
S5	42°30′	63°30′	2	−0	301	257
S3	42°45′	63°30′	2	+0	320	250
S1	42°49′	63°30′	4	−2	282	346
S6	43°00′	63°30′	6	−2	295	356
SS13	44°17′	63°46′	3	+1	181	134
SS12	44°25′	63°57′	2	+1	261	330
S2	42°46′	64°00′	7	−1	240	335
S7	42°42′	64°02′	3	−1	279	326
C5	43°43′	65°06′	6	+4	269	342
C1	43°11′	65°43′	26	+4	323	296
C3	42°50′	65°50′	26	−4	343	316
NORTHEAST CHANNEL						
NEC1	42°22′	65°56′	26	−6	324	341
NEC2	42°18′	65°58′	22	−8	330	328
NEC3	42°11′	66°02′	27	−8	331	344
BAY OF FUNDY						
BED66	42°25′	65°07′	41	+2	1	74
GEORGES BANK						
L	41°42′	66°36′	35	−24	351	340
M1	42°04′	67°52′	14	−4	298	347
M4	40°56′	66°58′	18	−11	358	339
P2	42°03′	67°15′	44	−15	346	346
P3	41°53′	67°15′	38	−20	349	3
M9	40°54′	67°24′	20	−11	340	358
A*	40°51′	67°24′	21.8±1.5	−12.9±0.9	349±3	341±6
K*	41°04′	67°34′	31.8±1.0	−20.2±1.1	354±3	339±5
M2	42°00′	67°49′	18	−8	294	354
GREAT SOUTH CHANNEL						
M	40°51′	68°49′	33	−12	19	17
B	40°49′	69°00′	32	−9	11	20
GSC2	40°51′	69°01′	12	−3	27	24
N	40°51′	69°01′	31	−11	18	25
R*	40°30′	69°07′	26.7±0.6	−12.2±0.8	28±3	31±5
GSC1	40°52′	69°11′	29	−10	30	36

Table II-1. M_2 bottom current—Continued

Station	Lat. °N.	Long. °W.	UMAJOR (cm/s)	UMINOR (cm/s)	PHASE (DEG-G)	ORIEN (DEG-TRUE)
LYDONIA CANYON						
LCA*	40°34′	67°45′	17.6±1.5	−8.3±3.1	346±0	337±2
LCB	40°32′	67°43′	4	+1	~145	344
LCE	40°25′	67°40′	11	+0	351	38
LCH	40°18′	67°40′	4	−1	326	24
LCI	40°23′	67°33′	4	−2	~300	~340
LCL	40°32′	67°36′	13	−9	349	354
LCM*	40°30′	67°49′	15.5±3.6	−9.9±2.4	333±11	344±11
NANTUCKET SHOALS						
NSA	41°31′	69°36′	36	−3	315	18
NSB	41°26′	69°44′	40	−11	336	42
NSD	41°37′	69°44′	25	+3	324	41
POLLOCK RIP	41°37′	69°54′	39	−3	291	29
GREAT ROUND	41°24′	69°55′	37	−11	347	80
NSC	41°37′	69°59′	29	−5	18	119
NSE	40°59′	70°04′	24	−18	18	135
NSFE1	40°41′	70°08′	14	−12	33	86
Q*	40°30′	70°13′	10.0±0.4	−7.4±0.3	41±2	88±4
NSFE3	40°20′	70°16′	7	−5	36	66
NSFE4	40°13′	70°18′	5	−4	37	59
NSFE5	40°02′	70°22′	3	−2	38	85
NEW ENGLAND SHELF						
P*	40°29′	70°30′	6.1±0.1	−5.1±0.2	16±11	74±5
NES742	40°35′	70°59′	5	−4	24	76
HENS&CHICK	41°27′	71°01′	12	−5	296	91
NES762	40°28′	71°12′	4	−3	74	134
MIDDLE ATLANTIC BIGHT						
P32	40°15′	71°51′	3	−2	213	318
LT5*	40°12′	72°00′	4.6±0.3	−2.3±0.1	226±18	306±10
P31	40°39′	72°15′	5	−1	215	285
LT4*	40°34′	72°19′	5.0±0.3	−1.1±0.1	232±5	276±1
CMICE	40°47′	72°29′	5	+0	~219	292
ME*	39°57′	72°36′	7.1	−2.9	235	326
LTM	40°07′	72°55′	7	+3	262	315
NJ4*	38°55′	72°58′	1	+0	229	244
MA*	39°27′	73°00′	7.3±1.3	−3.4±0.1	226±9	319±90
LT3	39°16′	73°02′	7	−4	255	320
LT7	39°55′	73°05′	6	−2	264	320
MESA7	39°55′	73°06′	5	−1	246	309
P12	39°09′	73°13′	6	−4	250	318
MF	38°31′	73°14′	2	−1	190	320
NJ3A	39°04′	73°20′	7	−4	262	319
15	40°26′	73°28′	7	−1	250	302
MC*	38°33′	73°31′	6.7	−3.1	250	321
49	39°38′	73°34′	8	−4	245	319
MB*	38°44′	73°38′	7.3±1.3	−3.4±0.4	259±4	316±2
LT6	40°08′	73°38′	4	+1	230	318
LT2	39°24′	73°43′	8	−4	260	325
P11	39°17′	73°55′	7	−3	245	318
MD*	38°59′	74°02′	6.8±0.6	−2.2±1.1	244±15	313±6
L.EGG INLET	39°28′	74°15′	4	−1	~275	~310
SOUTHERN MID-ATLANTIC BIGHT						
MAB	36°50′	75°02′	7	−3	273	251
CHESAPEAKE	36°59′	75°42′	4	−0	337	291

APPENDIX III - TIDE GENERATION

The total current, U, or sea-level elevation, H, is represented by the sum of all the tidal constituents:

$$U \text{ or } H = \Sigma f u_i \cos(\omega_i t - \phi_i) \qquad \text{eq. III-1}$$

where i denotes a constituent, u_i is the amplitude of either the east or north component of current or the amplitude of the sea-level elevation and t is local time. A small correction due to the moon's node is given by "f" (see table III-1), and ω_i is the frequency of the constituent in degrees per solar hour.

Table III-1. Correction, f, for moon's node (period = 18.61 years) adapted from table 14 of Schureman (1941) for 1976–1980

Constituent	1976	1977	1978	1979	1980
M_2 & N_2	1.029	1.035	1.038	1.036	1.030
K_1	0.916	0.891	0.882	0.890	0.913
O_1	0.863	0.822	0.806	0.819	0.858

The phase lag, ϕ_i of each constituent is measured from the 0 hour or the beginning of the desired time series, and it is related to the Greenwich phase (G) and to S, the longitude of the time meridian of observation, by equation 321 in Schureman (1941) which is

$$\text{Greenwich phase (G)} = \text{Greenwich } (V_0 + u) + \omega_i S/15 + \phi_i$$

thus

$$\phi_i = \text{Greenwich phase (G)} - \text{Greenwich}(V_0 + u) - \omega_i S/15 \qquad \text{eq. III-2}$$

where the Greenwich phase (G) can be found in this atlas. The Greenwich $(V_0 + u)$ is the time difference (expressed in degrees) between the transit of the Greenwich meridian of a fictitious moon (associated with each constituent and having a frequency ω_i) and the Greenwich 0 hour of the day the time series begins. Greenwich $(V_0 + u)$ is found using tables 15, 16, 17, and 18 in Schureman (1941).

The three semidiurnal constituents M_2, S_2, and N_2 along with the two diurnal constituents K_1 and O_1 are the most important in generating a tidal series and these tidal frequencies and periods are listed in table 1.

Example: What are the equations for the east and north components of the tidal current at 60 m and the sea-level elevation at station K beginning February 1, 1978 at 0100 local time using the five major constituents M_2, S_2, N_2, K_1, and O_1?

From Schureman the equilibrium argument $(V_0 + u)$ is the sum of the values for year, month, day, and hour shown in table III-2.

The Fourier coefficients at station K at depth 60 m are taken from this atlas (tables 4–9) and listed in table III-3 along with the phase lag ϕ_i computed from eq. III-2.

Substituting into eq. III-1 gives for the tidal currents:

$$\begin{aligned} U_{east}(cm/s) &= 22.9\cos(28.984t - 136°) \\ &+ 3.3\cos(30.000t - 328°) + \\ &\quad 4.6\cos(28.440t - 062°) \\ &+ 2.6\cos(15.041t - 027°) + \\ &\quad 1.2\cos(13.943t - 281°) \\ U_{north}(cm/s) &= 31.6\cos(28.984t - 028°) \\ &+ 4.7\cos(30.000t - 222°) + \\ &\quad 6.6\cos(28.440t - 316°) \\ &+ 2.3\cos(15.041t - 310°) + \\ &\quad 1.2\cos(13.943t - 204°) \end{aligned}$$

and after similar calculations, the sea-level elevation is:

$$\begin{aligned} H(cm) &= 41.4\cos(28.984t - 038°) \\ &+ 8.6\cos(30.000t - 218°) + \\ &\quad 10.3\cos(28.440t - 334°) \\ &+ 6.5\cos(15.041t - 045°) + \\ &\quad 5.0\cos(13.943t - 331°) \end{aligned}$$

Table III-2. Calculation of Greenwich ($V_o + u$)

	M_2	S_2	N_2	K_1	O_1	Reference
1978	201.80	0.00	290.60	10.50	191.30	p. 210, Table 15
February	324.17	0.00	279.16	30.56	293.62	p. 212, Table 16
1	0.00	0.00	0.00	0.00	0.00	p. 213–5, Table 17
0100	28.98	30.00	28.44	15.04	13.94	p. 216–7, Table 18
Greenwich ($V_o + u$)	194.95	30.00	238.20	56.10	138.86	

Table III-3. Fourier coefficients and computation of ϕ_i

	M_2		S_2		N_2		K_1		O_1	
Amplitude	*east*	*north*	*east*	*north*	*east*	*north*	*east*	*north*	*east*	*north*
u(cm/s)	22.1	30.4	3.3	4.7	4.4	6.4	3.0	2.6	1.5	1.5
Phase										
Greenwich (G)	116°	8°	148°	42°	82°	336°	158°	81°	130°	53°
− Greenwich ($V_o + u$)	−195°	−195°	−30°	−30°	−238°	−238°	−56°	−56°	−139°	−139°
$-\omega_i S/15$	−145°	−145°	−150°	−150°	−142°	−142°	−75°	−75°	−70°	−70°
Phase lag ϕ_i	136°	28°	328°	222°	62°	316°	27°	310°	281°	204°

PLATES 3–12 AND 14–21

(Plates 1, 2, and 13 are in pocket)

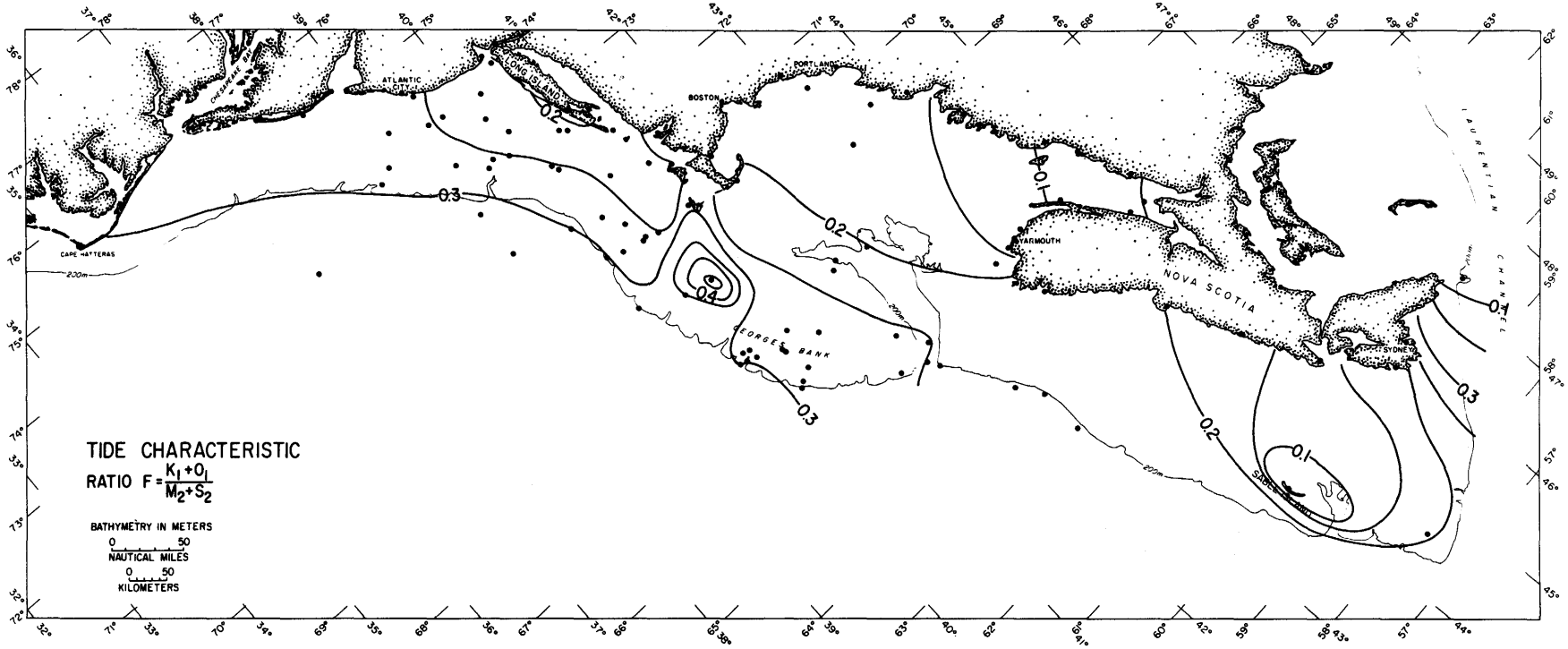

Plate 3. F values for study region.

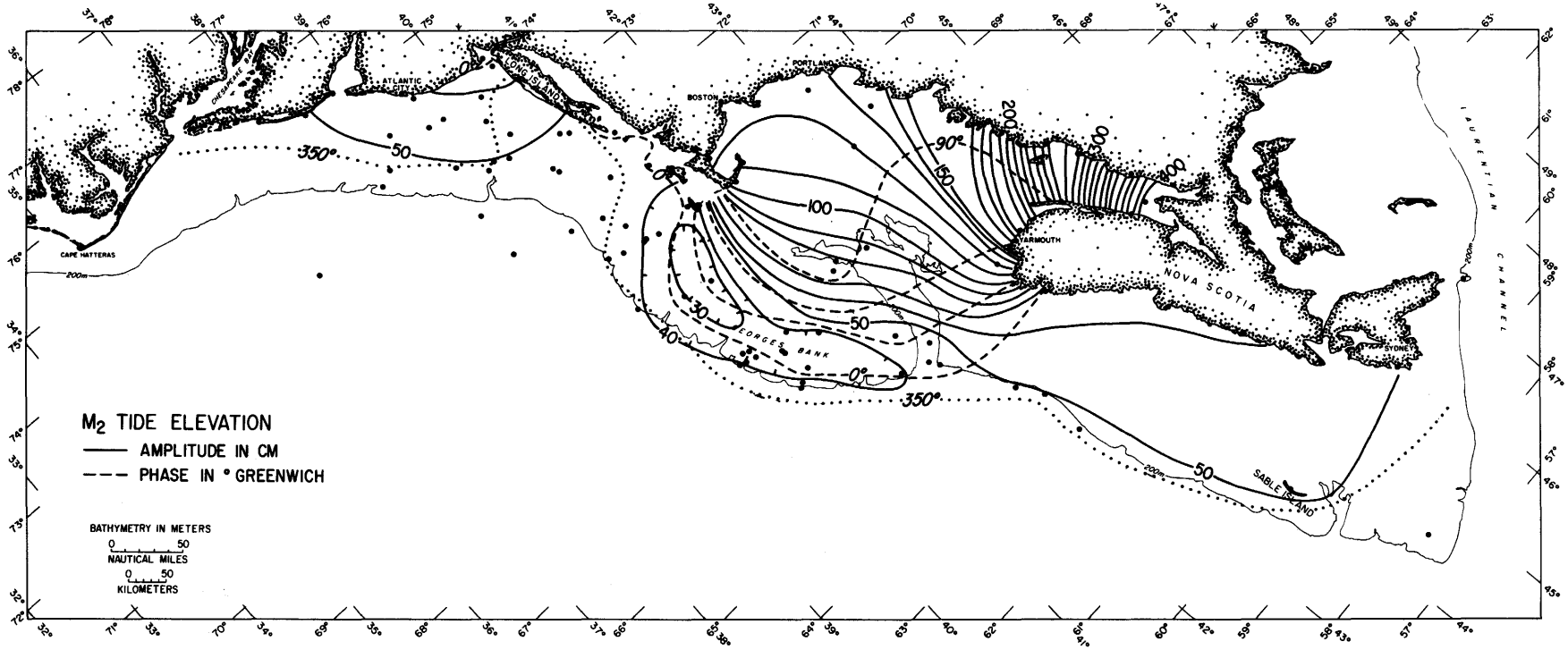

Plate 4. Coamplitude and cophase lines for the M_2 (12.42 hours) semidiurnal tide. The tide is in co-oscillation across the Middle Atlantic and Scotian Shelves and near resonance in the Gulf of Maine. The 350° phase line (shown dotted to emphasize a change in phase contour interval) has been added to indicate the simultaneous arrival of the tide along the entire shelf break and so that the phase can be compared to existing North Atlantic cotidal charts (see Defant, 1958; Beaumont and Boutilier, 1978). Note the amplitude minimum over Nantucket Shoals and the southern flank of Georges Bank.

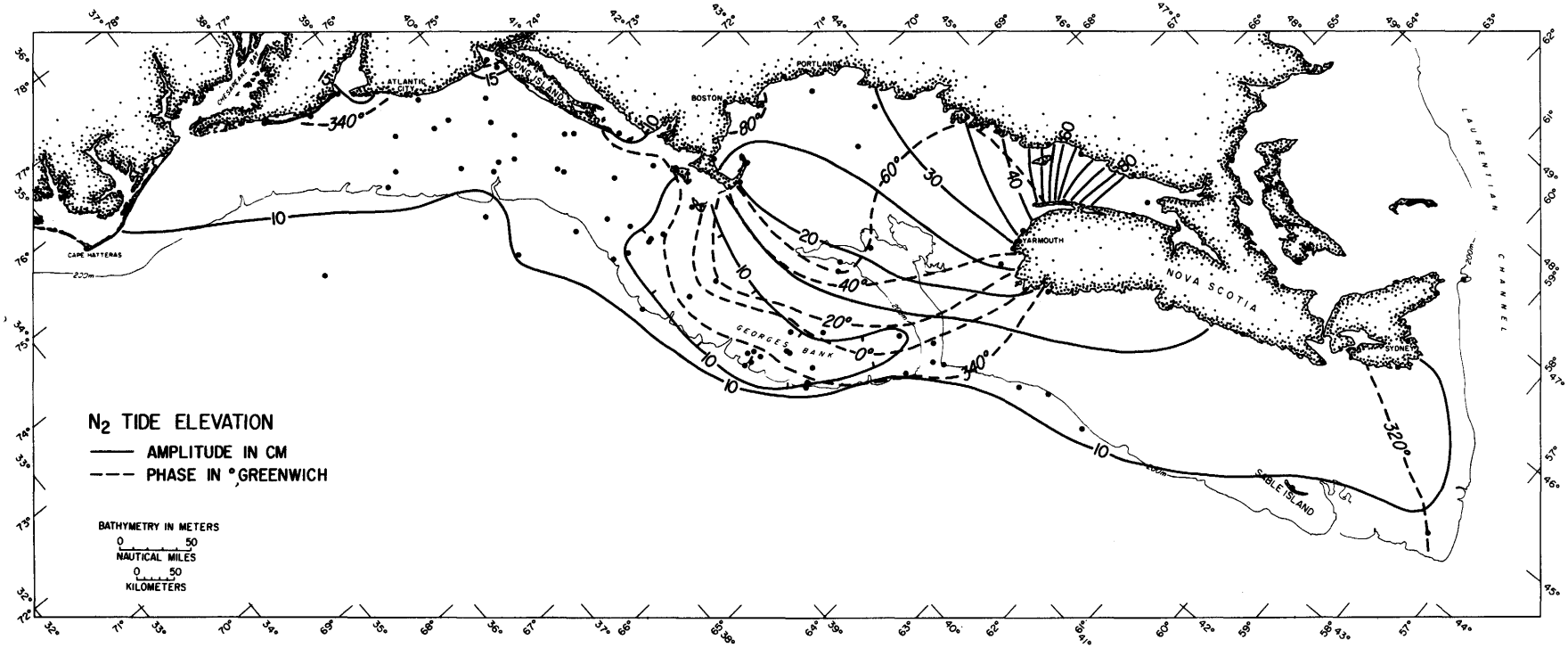

Plate 5. Coamplitude and cophase lines for the N_2 (12.66 hours) semidiurnal tide. Cophase lines are similar to the M_2 tide and the amplitudes are approximately 25 percent of the amplitude of the M_2.

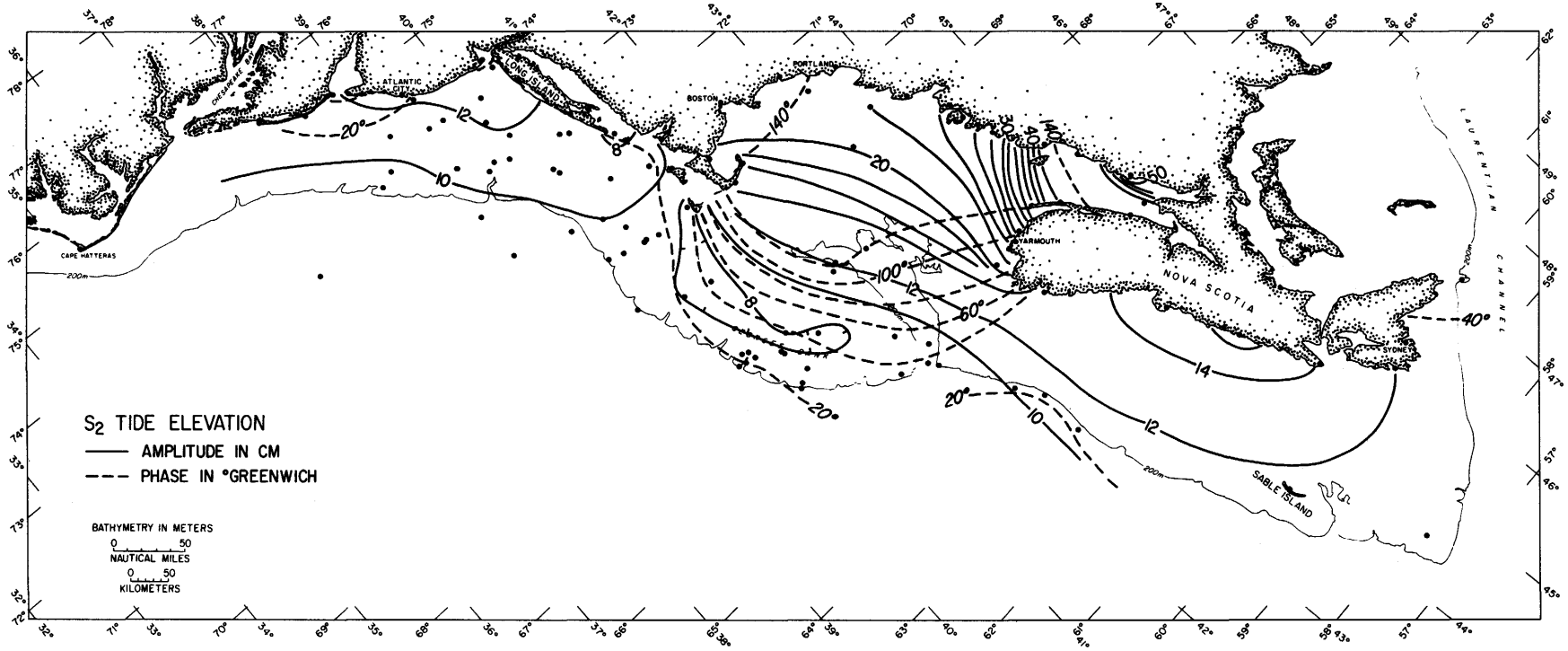

Plate 6. Coamplitude and cophase lines for the S_2 (12.00 hours) solar semidiurnal tide.

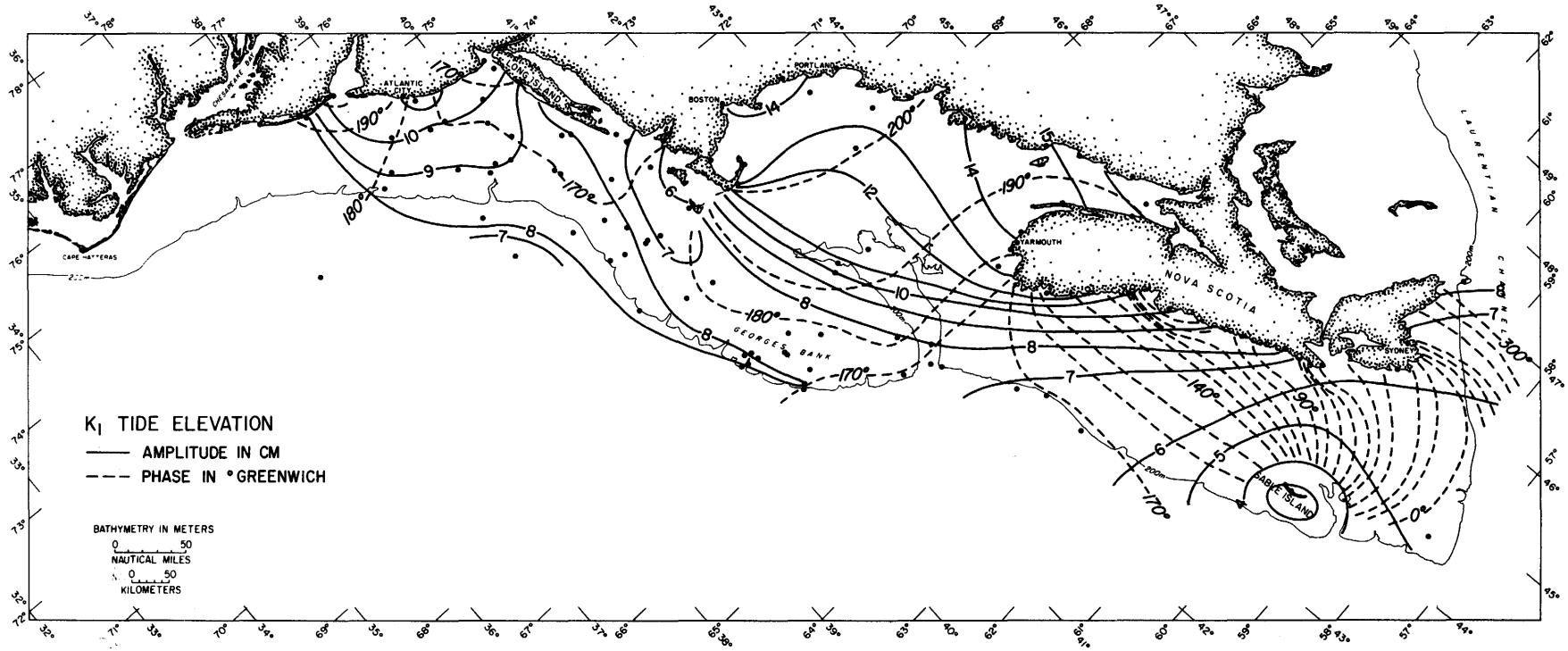

Plate 7. Coamplitude and cophase lines for the K_1 (23.93 hours) diurnal tide. There are three amphidromes, one near Sable Island, one near Cape Cod, and one near Atlantic City, N. J. The open circles indicate the locations of additional stations (not included in table 4) used to contour the amphidromic system near Sable Island (Canadian Hydrographic Service, 1969a).

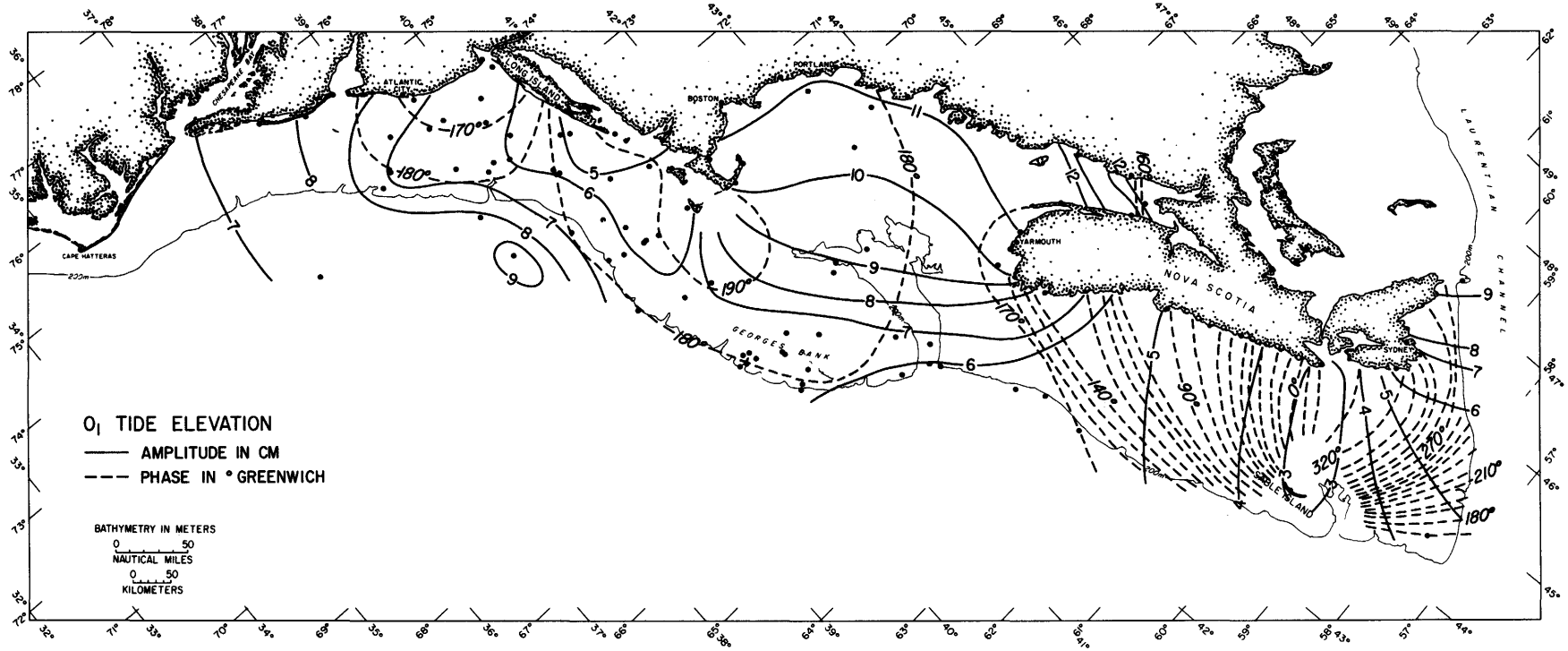

Plate 8. Coamplitude and cophase lines for the O_1 (25.82 hours) diurnal tide. Notice the amphidromic point near Sable Island and the unusual increase in amplitude across the shelf just east of Long Island. The open circles represent the location of additional stations (not in table 4) used to contour the amphidromic system near Sable Island (Canadian Hydrographic Service, 1969a).

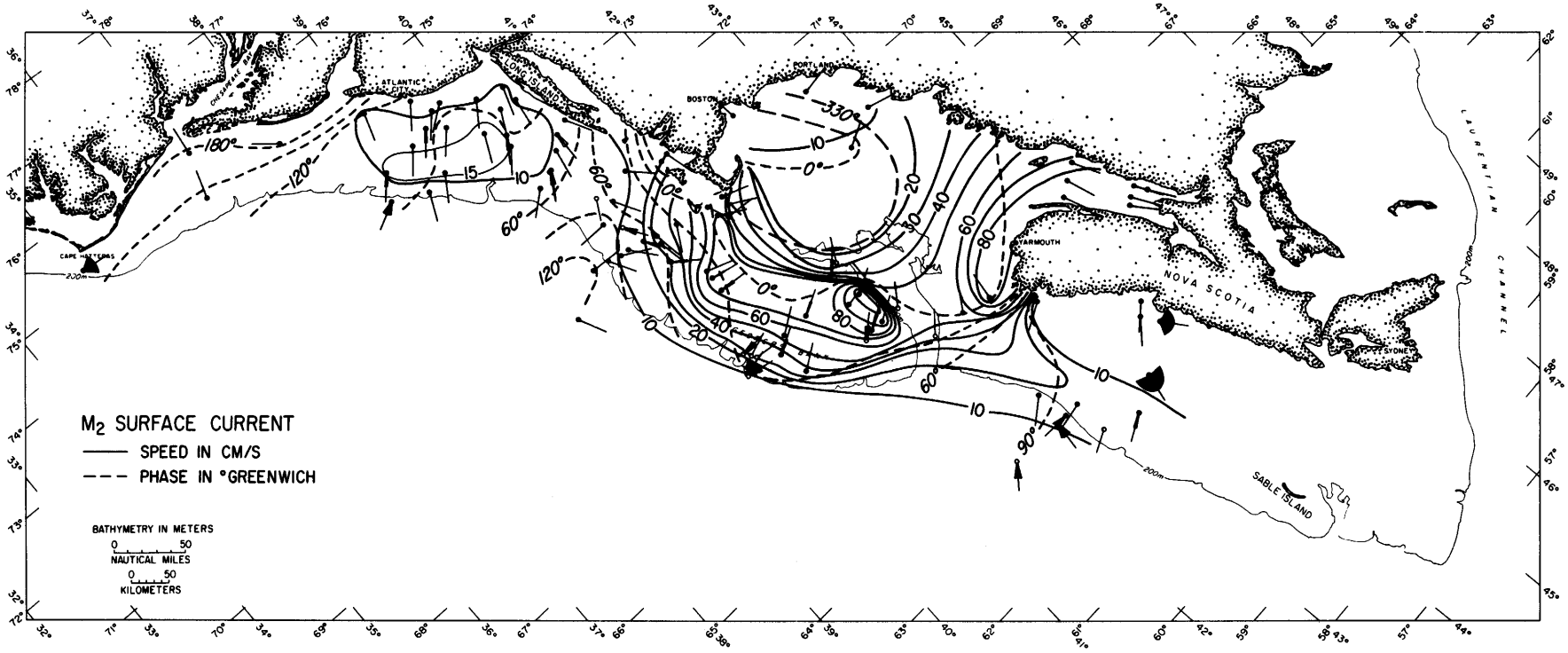

Plate 9. Magnitude of the major axis (UMAJOR) and phase of the M_2 surface current. The observations used to draw this map of surface currents were obtained at depths less than 35 m from the sea surface (plate 2) and are indicated by solid circles. The lines indicate the ellipse orientation. The standard deviation of the ellipse orientation is shown by shaded sectors at stations where the standard deviation was computed. The phase of maximum current is relative to the indicated orientation. Note that the ellipse orientation and phase may be adjusted by 180°. The ellipse orientation was selected so that the phase of the current varied smoothly. To expand the spatial coverage, observations at depths greater than 35 m were used in some locations (indicated by open circles). At these locations, the tide was assumed to be barotropic.

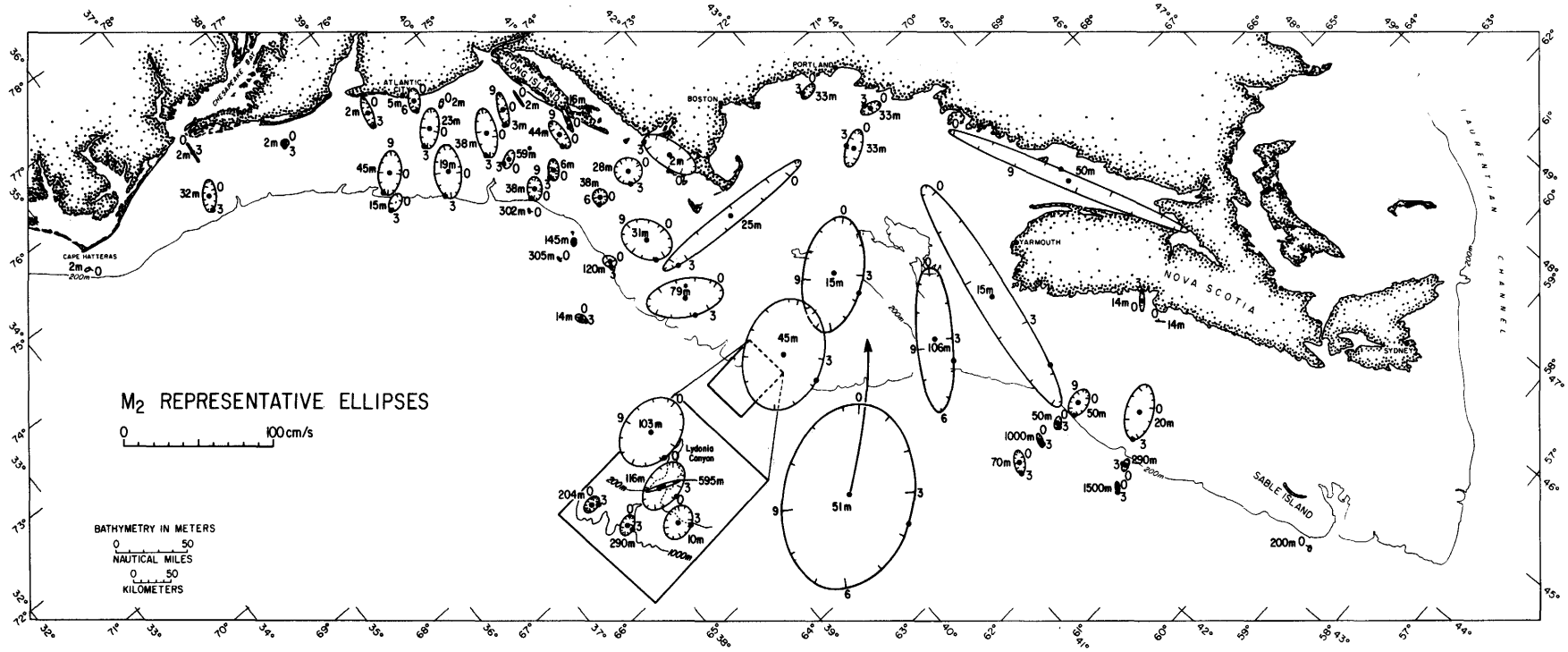

Plate 10. Representative M_2 tidal ellipses. Ellipses were selected to be representative and located at approximately mid-water depth. Numbers inside or near the ellipses are the instrument depths in meters below the sea surface. Tick marks along the edge of the ellipse indicate the Greenwich hour. The time of Boston high water is shown by a solid circle between 3- and 4-hour Greenwich. Asterisks are stations 1 mab.

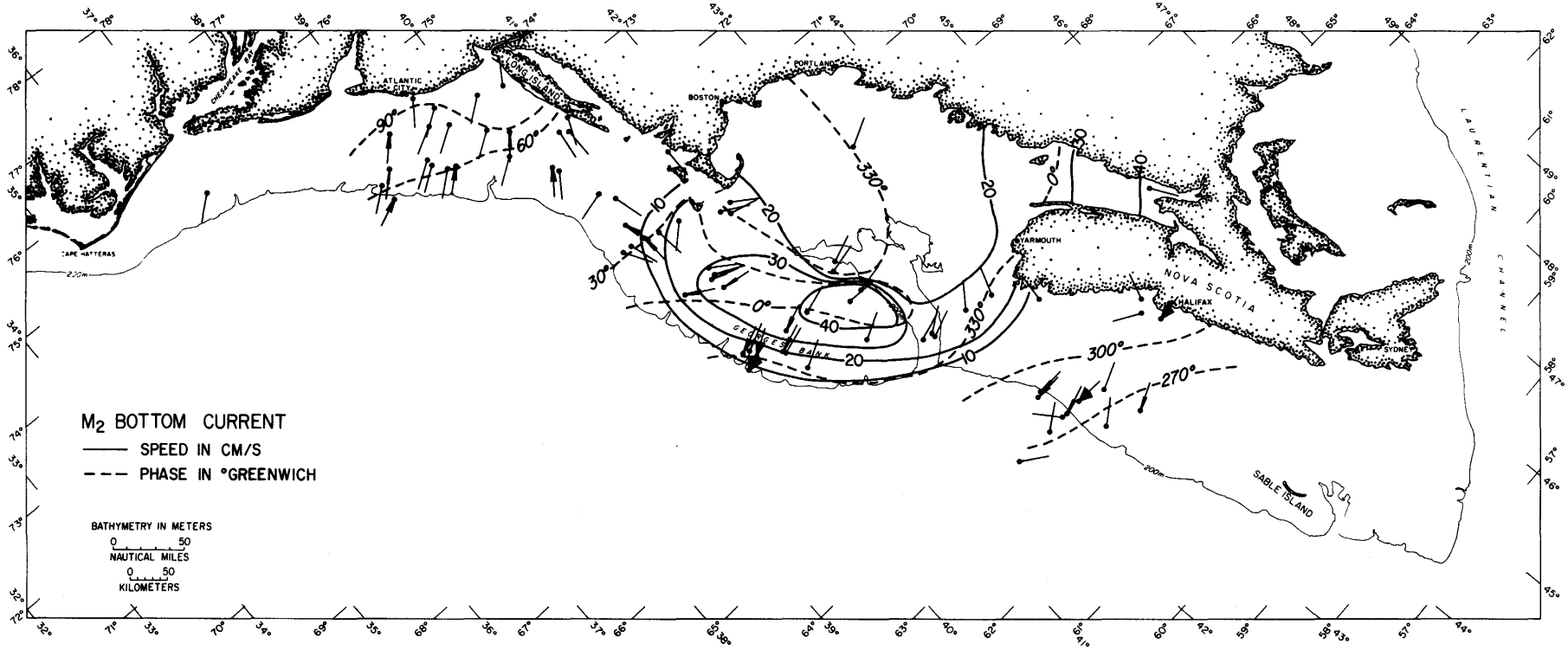

Plate 11. M_2 currents at 1 meter above bottom. Current measurements made at 14 stations and estimates (based on an empirical curve and near-bottom measurements) at 64 additional stations were used to contour phase and maximum speed. See text for discussion of the empirical curve used and appendix II for measured and computed values of the tidal current 1 mab. All phases are relative to the orientations shown. The shaded sectors indicate the estimated uncertainty in the ellipse orientation.

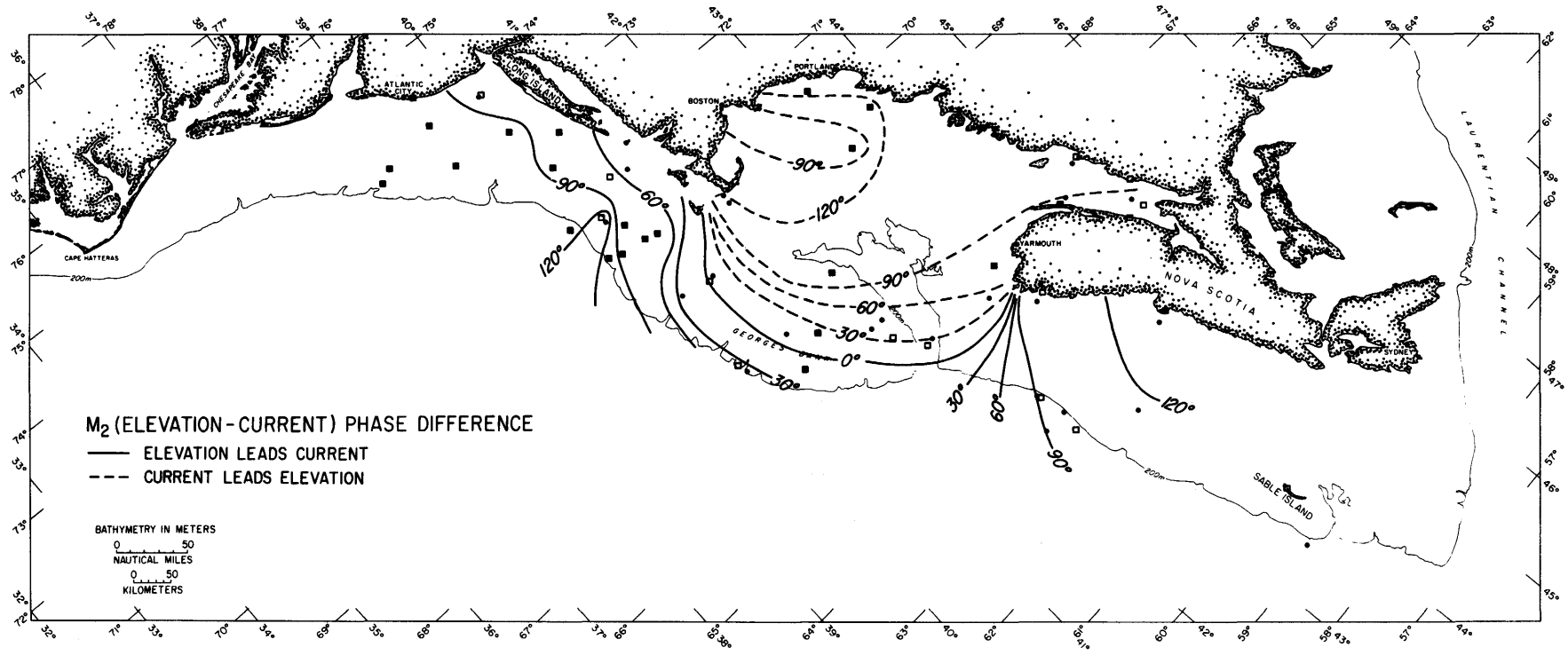

Plate 12. Phase difference (elevation minus current) for the M_2 tide. The open squares are the locations of tidal elevation data and the solid circles are the location of current data used to draw the lines of equal phase difference. Solid squares are locations for which both tidal elevation and current data were available. The average standard deviation of the phase difference was $< 10°$.

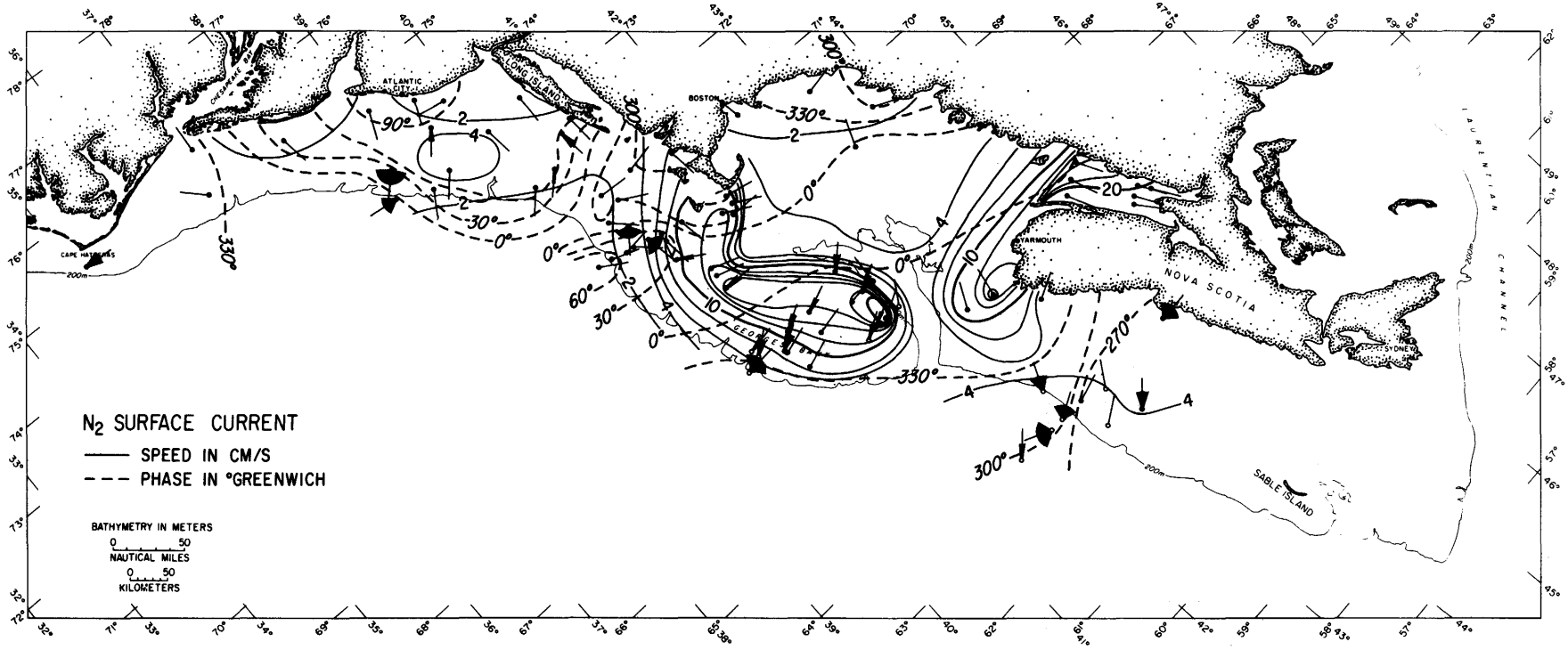

Plate 14. Magnitude of the major axis (UMAJOR) and phase of the N_2 surface current. See plate 9 for explanation of symbols.

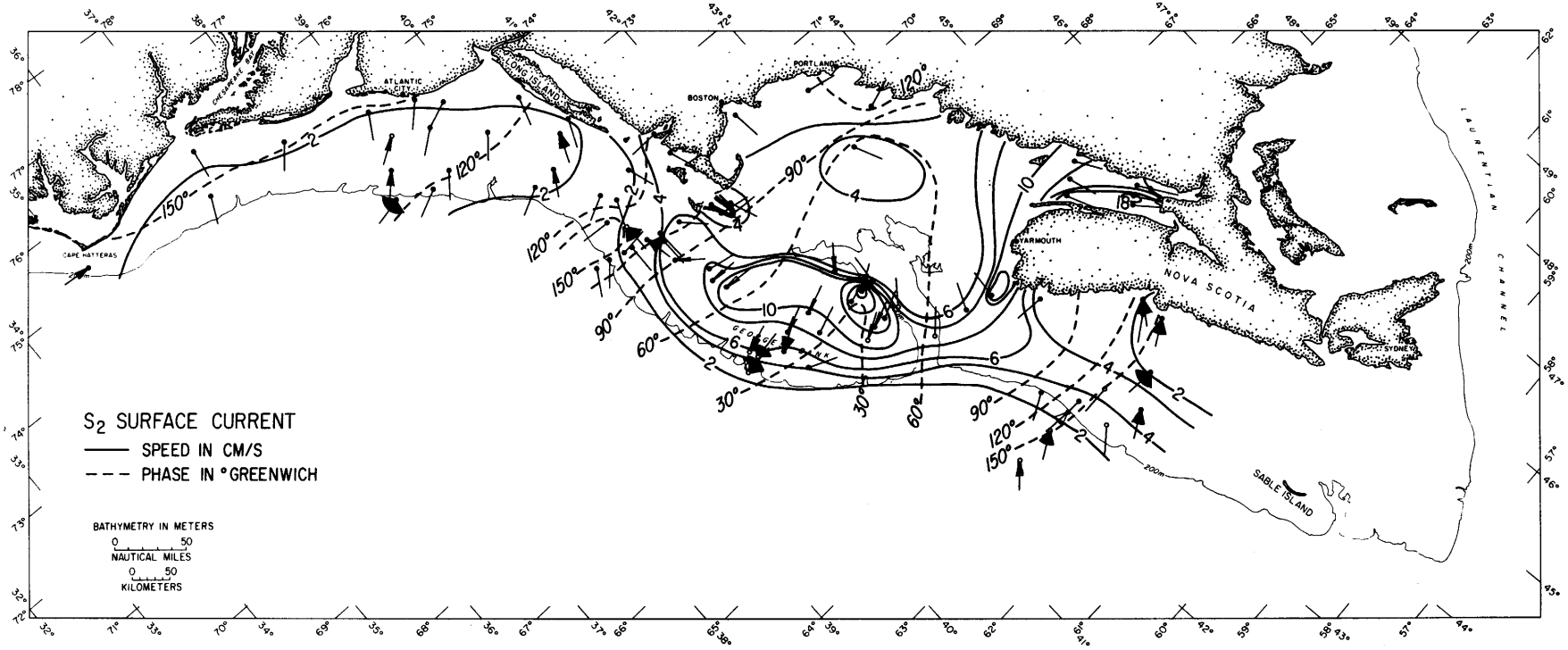

Plate 15. Magnitude of the major axis (UMAJOR) and phase of the S_2 surface current. See plate 9 for explanation of symbols.

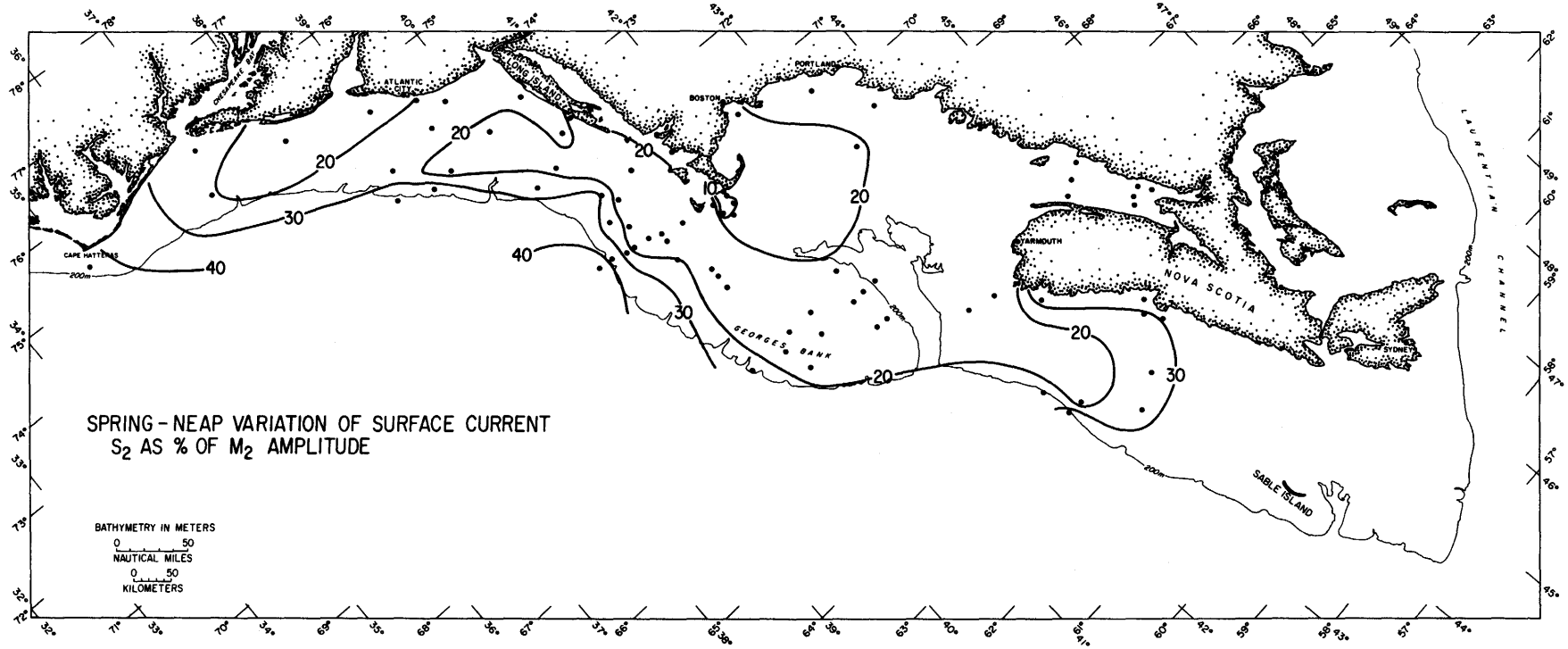

Plate 16. Spring-neap variation of the amplitude of the semidiurnal tidal current caused by the S_2 solar tide expressed as a percent of the M_2 tidal current.

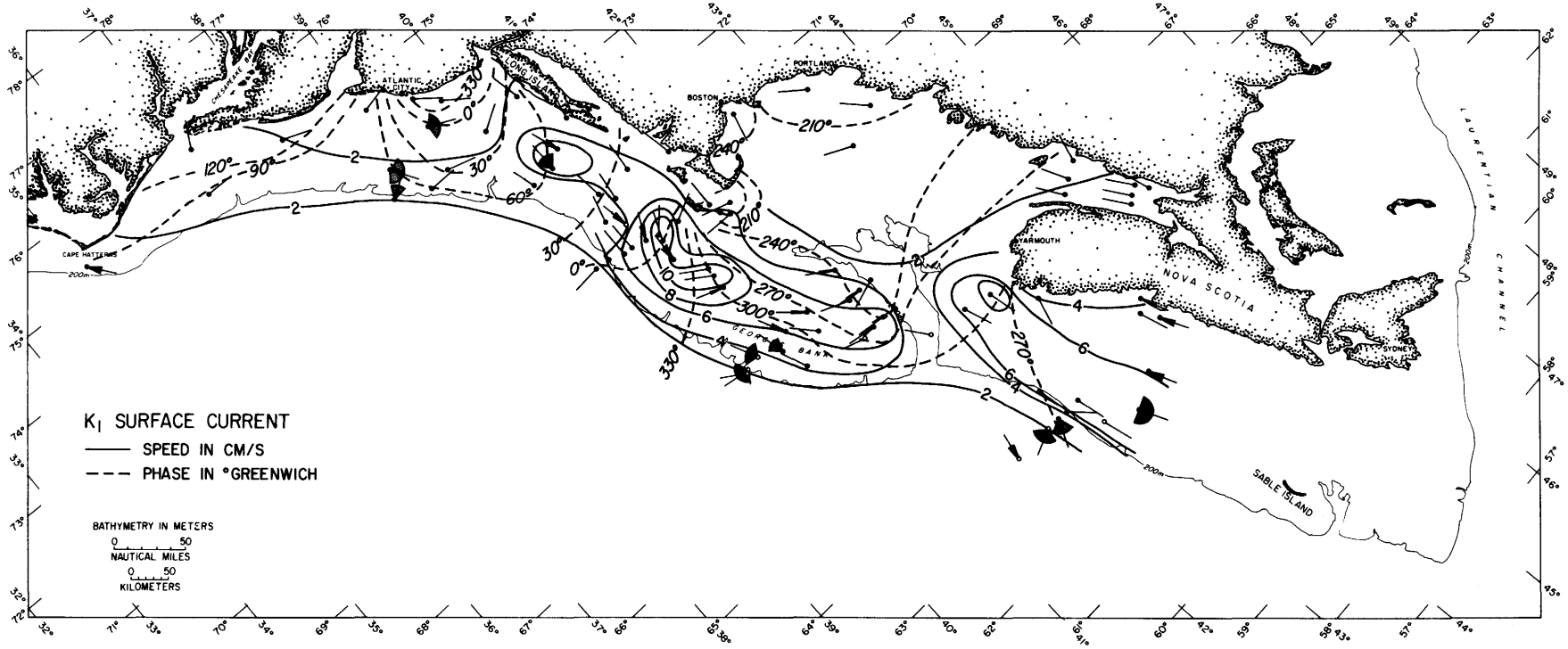

Plate 17. Magnitude of the major axis (UMAJOR) and phase of the K_1 surface current. See plate 9 for explanation of symbols.

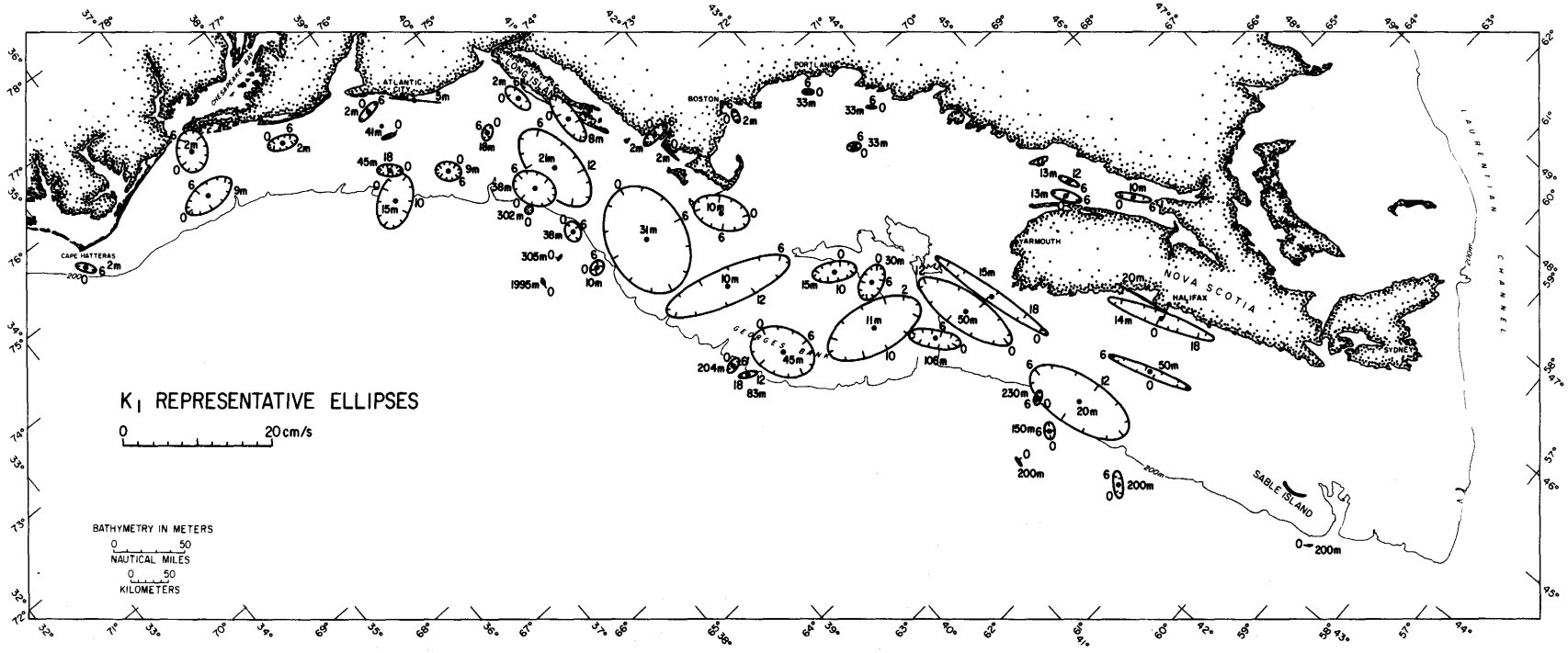

Plate 18. Representative K_1 tidal ellipses. Note that these ellipses are not drawn at the same scale as the M_2 ellipses in plate 10. Ellipses were selected to be representative and located at approximately midwater depth. Numbers inside or near the ellipses are the instrument depths in meters. Tick marks along the edge of the ellipse indicate the Greenwich hour.

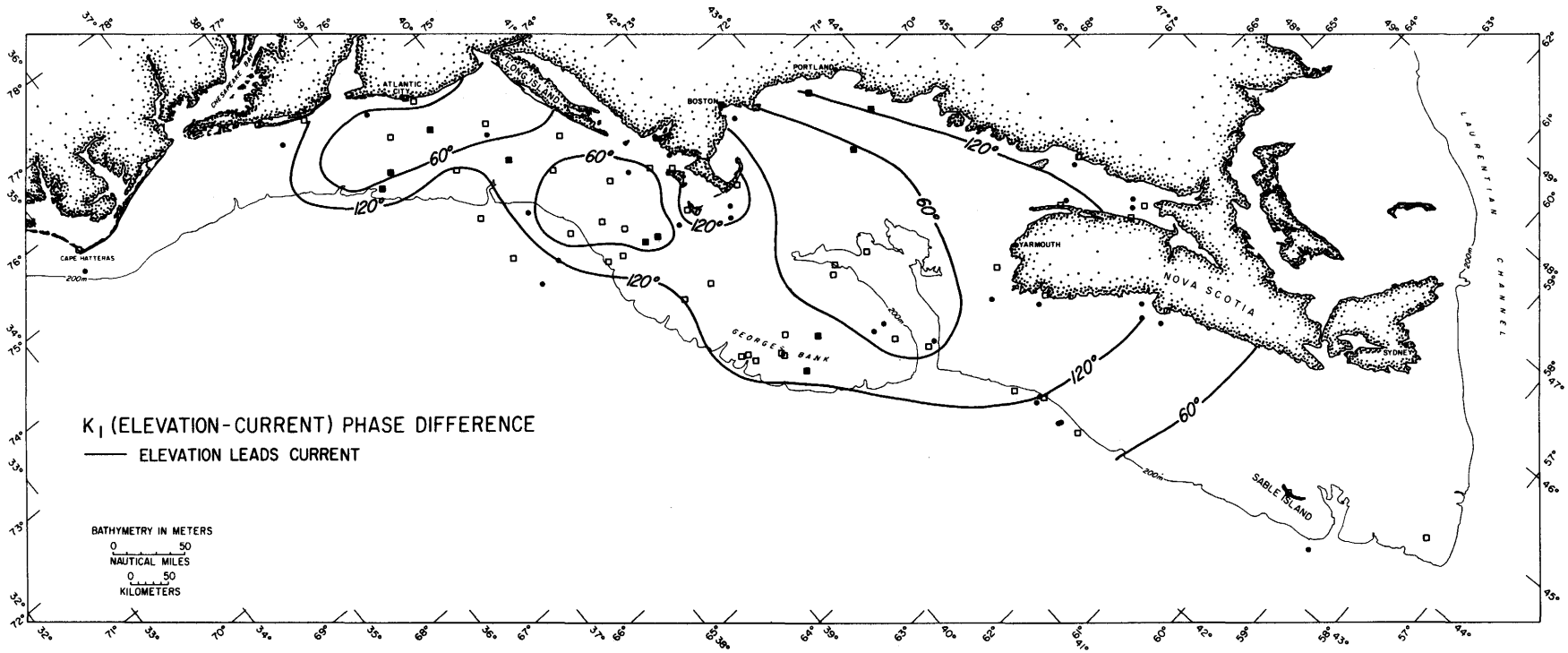

Plate 19. Phase difference (elevation minus current) for the K_1 tide. The open squares are the locations of tidal elevation data and the solid circles are the locations of current data used to draw the lines of equal phase difference. Solid squares are locations with both tidal elevation and current data. The uncertainty (average standard deviation) in the phase difference is approximately $\pm 33°$.

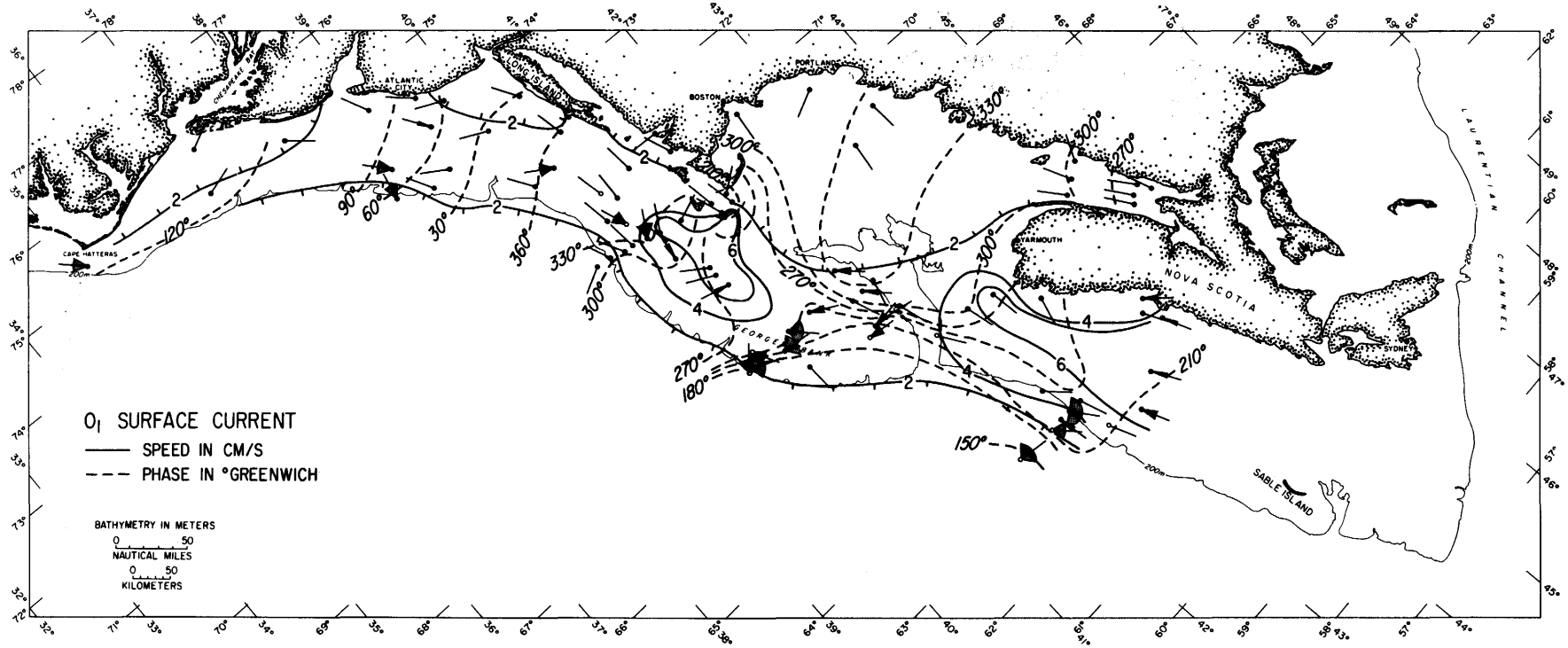

Plate 20. Magnitude of the major axis (UMAJOR) and phase of the O_1 surface current. See plate 9 for explanation of symbols.

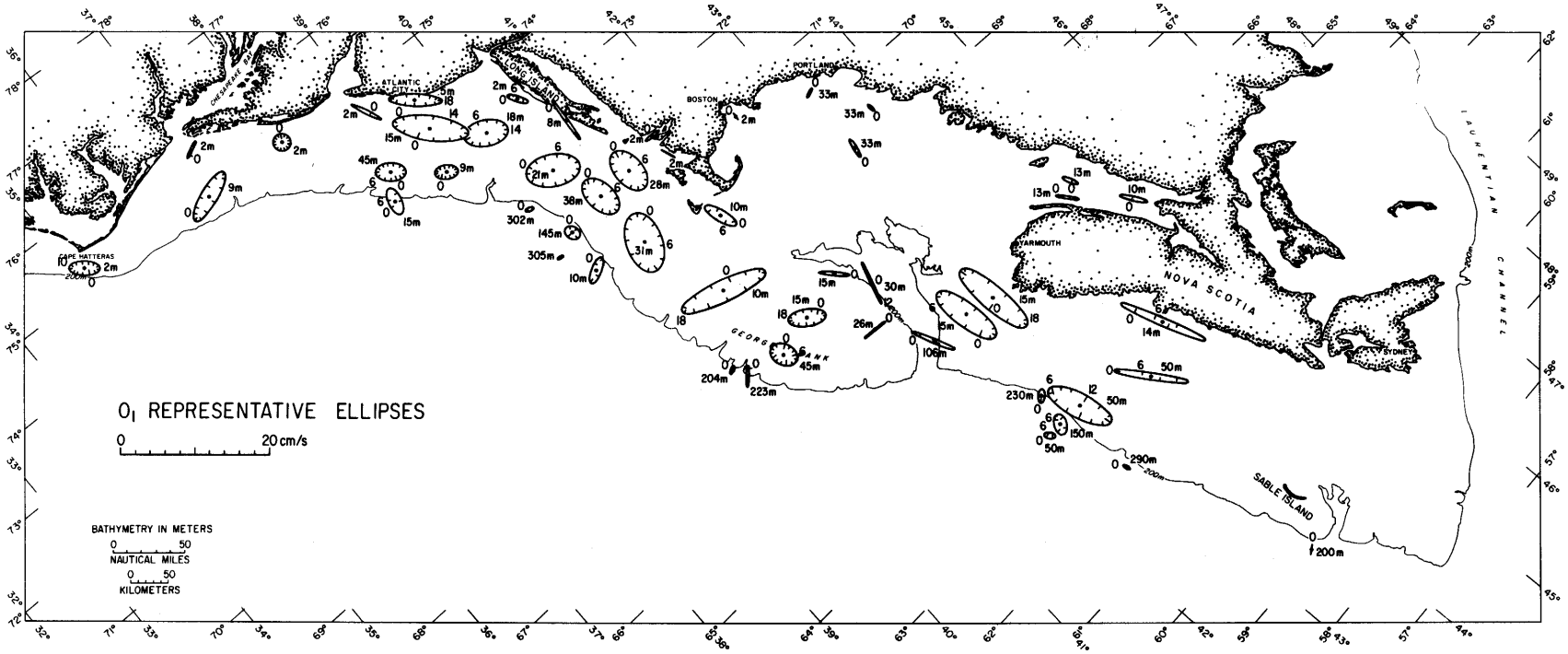

Plate 21. Representative O_1 tidal ellipses. These ellipses are drawn at the same scale as the K_1 ellipses (plate 18) but not at the same scale as the M_2 ellipses (plate 10). See plate 18 for explanation of symbols.