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John F. Miller
Chief, Water Management Information
Division
Office of Hydrology, NWS

NOAA Technical Report NWS 26

Frequency and Motion of Atlantic Tropical Cyclones

Washington, D. C.
March 1981

U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

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WB 5 Climatological Probabilities of Precipitation for the Conterminous United States. Donald L. Jorgensen, Techniques Development Laboratory, December 1967, 60 p.

WB 6 Climatology of Atlantic Tropical Storms and Hurricanes. M. A. Alaka, Techniques Development Laboratory, May 1968, 18 p.

WB 7 Frequency and Areal Distributions of Tropical Storm Rainfall in the United States Coastal Region on the Gulf of Mexico. Hugo V. Goodyear, Office of Hydrology, July 1968, 33 p.

WB 8 Critical Fire Weather Patterns in the Conterminous United States. Mark J. Schroeder, Weather Bureau, January 1969, 31 p.

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WB 11 Monthly Mean 100-, 50-, 30-, and 10-Millibar Charts and Standard Deviation Maps, 1966-1967. Staff, Upper Air Branch, National Meteorological Center, April 1969, 124 p.

WB 12 Weekly Synoptic Analyses, 5-, 2-, and 0.4-Millibar Surfaces for 1967. Staff, Upper Air Branch, National Meteorological Center, January 1970, 169 p.

NOAA Technical Reports

NWS 13 The March-April 1969 Snowmelt Floods in the Red River of the North, Upper Mississippi, and Missouri Basins. Joseph L. H. Paulhus, Office of Hydrology, October 1970, 92 p. (COM-71-50269)

NWS 14 Weekly Synoptic Analyses, 5-, 2-, and 0.4-Millibar Surfaces for 1968. Staff, Upper Air Branch, National Meteorological Center, May 1971, 169 p. (COM-71-50383)

NWS 15 Some Climatological Characteristics of Hurricanes and Tropical Storms, Gulf and East Coasts of the United States. Francis P. Ho, Richard W. Schwerdt, and Hugo V. Goodyear, May 1975, 87 p. (COM-75-11088)

(Continued on inside back cover)

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Frequency and Motion of Atlantic Tropical Cyclones

C. J. Neumann and M. J. Pryslak

National Hurricane Center
Coral Gables, Fla.

Washington, D.C.
March 1981

U. S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary

National Oceanic and Atmospheric Administration
James P. Walsh, Acting Administrator

National Weather Service
Richard E. Hallgren, Director

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FREQUENCY AND MOTION OF ATLANTIC TROPICAL CYCLONES

Charles J. Neumann and Michael J. Pryslak

National Hurricane Center[1]
Coral Gables, FL 33146

ABSTRACT. Over the period 1899-1978, 663 tropical storms and hurricanes were recorded over the Atlantic area. This study presents a statistical analysis of these storms and includes charts of: (1) average storm frequency per unit area per 100-year interval, (2) mean resultant speed and direction, and (3) storm tracks upon which (1) and (2) are based. Tables also present the means and standard deviations of storm translation speed. The charts and tables are stratified by overlapping 30-day periods and by storm intensity.

1. INTRODUCTION

Over the past decade, statistical studies relating to frequency and motion of Atlantic tropical cyclones have been prepared in various formats, each study being tailored to the needs of a particular user group. For example, Simpson and Lawrence (1971), Sugg et al. (1971), and Hebert and Taylor (1975, 1978) dealt with statistical aspects of hurricanes that have affected the United States. These studies, conducted at the National Hurricane Center (NHC), were prompted by disaster preparedness needs. Additional studies by the NOAA/NWS Office of Hydrology in connection with the Federal Flood Insurance Program also focused on storms that affected the United States, but in relation to the storm surge (coastal inundation) problem. Examples within this category include Ho et al. (1975) and Schwerdt et al. (1979).

Other studies treat the entire Atlantic tropical cyclone basin. These include reports by Jarvinen and Neumann (1978), Neumann et al. (1978), and Crutcher (1971). Our analysis also treats the entire basin, but in greater temporal and spatial detail than before. It can be considered an update to the report of Hope and Neumann (1969), an out-of-print but often requested NHC publication.

The material presented here should be useful to both coastal and maritime interests. Included are charts and tables that depict frequency and motion characteristics for various storm intensities. The data are summarized for overlapping periods within the June through November Atlantic hurricane season.

2. DATA SOURCE

Tropical cyclone track and associated storm intensity data, 1899 through 1978, as described by Neumann et al. (1978) and Jarvinen and Caso (1978),

[1] Study partially supported by NOAA/ERL AOML-National Hurricane Research Laboratory (NHRL).

were the sole data sources used in the preparation of the charts. The question arises as to the accuracy of these data. Observations over oceanic areas traversed by tropical cyclones have always been meager and, before the era of aircraft reconnaissance that began in 1944, virtually nonexistent. Typically, pre-1944 track and intensity data were inferred from indirect evidence, such as peripheral ship and island reports. Even with the aid of aircraft weather reconnaissance, it was not until 24-hour weather satellite coverage began in the mid-1970s that frequent tropical cyclone position and wind estimates became available. Consequently, the quality of the data, particularly in the early years, is considerably better near populated land areas (such as the Gulf of Mexico or Caribbean Sea) than over the ocean. Many other factors relate to the quality and interpretation of the data. Users should be aware of these factors and refer to Neumann et al. (1978) before making further interpretations.

Although track and intensity data are available for years before 1899, these were excluded because they were considered questionable and too fragmented to be of value. Between 1899 and 1978, 663 tropical cyclones (sustained 1-minute average wind speeds of at least 34 knots) were recorded and used in this study. Of these storms, 383 (58%) became hurricanes (sustained 1-minute average wind speeds of at least 64 knots). After moving inland or over colder waters, tropical cyclones often became extratropical. These extratropical stages were included in the computations, provided the intensity criteria were satisfied. Tropical depressions (sustained wind speeds below 34 knots) were excluded.

3. COMPUTATIONAL PROCEDURES

3.1 Requirement for Interpolation

The data set (Jarvinen and Caso, 1978) upon which all computations were based gives the position and intensity of tropical cyclones at 6-hour intervals, 0000, 0600, 1200, and 1800 GMT. For the purposes of this study, positions and intensities were required at hourly intervals, rather than at the 6-hour intervals given on the tape. A bivariate scheme described by Akima (1970) was used for the interpolation.

3.2 Grid System

The computational procedure required that a grid system be established across the Atlantic tropical cyclone basin. For convenience, a grid was selected having equally spaced points on a Mercator projection, true at 22.5°N. The domain of the grid extended from the Equator to 50°N and from 15°W to 105°W. A 60-n.mi. (111.2-km) grid spacing at the Equator resulted in a grid array having 54 rows and 91 columns (4,914 points).

For digital counting purposes, a circle of 75-n.mi. (139-km) radius was centered at each of the 4,914 grid points. Hourly positions of the 663 storms were passed through the grid network and the following data were computed for each circular area:

1) The number of storms passing through the area

2) The average meridional component of storm motion

3) The average zonal component of storm motion

4) The average translation speed without regard to direction

5) The standard deviation of item 4.

The choice of a 75-n.mi. circle was prompted by the fact that this is the average area typically associated with damage, damage potential, or damage concern. The area of a 75-n.mi. circle approximates the area of the 2 1/2-degree latitude/longitude boxes used by Hope and Neumann (1969) in a similar study.

The speed and motion component tabulations were calculated so as to avoid bias toward slower moving storms, which have a greater number of hourly positions within a given area. We made this calculation by computing average components of motion and the means and standard deviations of storm speed for each storm and area. A similar procedure was used by Hope and Neumann (1969).

3.3 Additional Computations

Storm frequency - The tabulation procedure outlined above yields the number of tropical cyclones passing through each circular area over the 80-year period. For user convenience, a 100-year frequency was estimated by multiplying the 80-year frequencies by the factor 100/80. The data were also passed through the nine-point smoothing-desmoothing filter discussed by Gerrity (1977) and Shuman (1957). After smoothing, the fields were analyzed by a digital objective procedure.

Storm motion - To portray expected storm motion vectors graphically, the meridional and zonal components of storm motion were interpolated bi-linearly to a less dense grid (fig. 1) with points distributed every 2 1/2 degrees of latitude/longitude over the tropical cyclone basin. Storm translation speeds and standard deviations were similarly interpolated.

4. CHARTS AND TABLES

Charts and tabular data depicting frequency and motion characteristics are presented in appendix A for portions of the hurricane season and for three wind speed criteria. Chart Series A (pp. A-3 through 44) is based on all tropical cyclone track segments having winds of at least tropical storm strength (1-minute sustained winds of at least 34 knots). Chart Series B (pp. A-45 through 53) and C (pp. A55 through 57) are similar to Series A, except they are based on track segments that have at least 64 knots (hurricane strength) and 100 knots, respectively. Because sample sizes decrease with increasing wind speed, the number of stratifications in each series is greater with the lower wind speeds. Temporal stratifications included in each chart series are listed in the introduction to each series.

5. DISCUSSION

Graphical and tabular data presented in the appendix should satisfy the needs of many interests. Some of the more obvious uses are determination of storm tracks and frequencies by area and assessment of seasonal shifts in this activity. Since the essential purpose of the study is presentation rather than discussion of the data, no attempt will be made to further analyze the charts and tabular listings. However, several less obvious applications of the data are discussed in this section.

5.1 Variability of Tropical Cyclone Motion

It is known that tropical cyclone motion is much more persistent in some areas than others. A measure of this "steadiness" can be obtained by dividing mean resultant storm speed for a given site (column D in the appendix tabular data) by the average speed (column E). When this ratio is high (approximately 0.90 or greater), the resultant direction (column C) can be relied upon to represent the most likely direction of motion through that area. When the ratio is low (approximately 0.75 or less), the interpretation is that the resultant direction has been computed from storms moving in a variety of directions. Consequently, it is likely that a storm might move in a direction quite different from that of the resultant direction.

As an example, consider the 2 1/2-degree latitude/longitude box number 122 (fig. 1, p. A-2) for 1 May - 30 Nov. in Chart Series A (p. A-44). Note that the resultant direction and speed are 279° at 13 knots, while the mean speed is also 13 knots. The interpretation is that storms moving through this area of the Caribbean would not be expected to deviate from the 279°/13 knot vector motion. Such information is very useful for forecasting.

As a contrasting example, consider box number 296, in the Gulf of Mexico. The resultant direction and speed on page A-44 are 354°/7 knots and the mean speed is 10 knots. The ratio 0.70 of resultant to mean speed is low. Accordingly, storms in this area can be expected to move in a variety of directions during the season. Further discussion relative to these "steadiness" values is given by Hope and Neumann (1971).

5.2 Tropical Storms Versus Hurricanes

Tropical cyclones tend to be more intense in certain areas of the Atlantic basin. A measure of this intensity index can be obtained from the ratio of the number of expected hurricanes (given in Chart Series B) to the number of expected hurricanes and tropical storms combined (given in Chart Series A).

As an example, consider the Miami, Fla., area (box number 298 in fig. 1) and the northeastern Gulf of Mexico (box number 332) during the May-November season. In the Miami area, 51 storms can be expected per 100 years (p. A-44). Of these, 31, or 61%, attained hurricane strength (p. A-53). In the northeastern Gulf of Mexico, the number of storms passing within 75 n.mi. of the center of the box is 55 per 100 years, which is higher than for the Miami area, but the number reaching hurricane strength (21 per 100 years) is much lower than for the Miami area, giving a percentage of 38. Further information relative to the ratio of hurricanes to combined hurricanes and tropical storms along the Gulf and Atlantic coasts is given by Ho et al. (1975).

5.3 Poisson Probabilities of Storm Occurrence

As shown by Hope and Neumann (1969), the number of tropical cyclones passing through a given area for a given time interval is described by the Poisson distribution function,

$$P(x) = e^{-m}\, m^x/x!, \qquad (1)$$

where P(x) is the probability ($0 \leq P \leq 1$) of exactly x tropical cyclones, e is the base of natural logarithms (~ 2.7183), m is the mean occurrence rate over the interval, and x! refers to x-factorial.

As an example of the computations, consider the 1 May - 30 Nov. period for box number 445 (off Cape Hatteras) on Chart Series A (p. A-44), where 76 storms can be expected per 100 years, giving a mean annual occurrence rate of 0.76. From eq. (1), the probability of having no storms pass within 75 n.mi. of the center of this box in a given year is 0.47. Similarly, the probability of observing exactly one, exactly two, or exactly three storms in a given year is 0.36, 0.14 and 0.03, respectively. The probability of having at least one storm is 0.53, at least two storms is 0.17, etc. Depending upon user requirements, the Poisson probabilities often provide a better measure of storm activity than the mean number of storms.

The chances of obtaining exactly x storms in N consecutive years can also be obtained by estimating an N-year mean by the algebraic product, N x m. For example, over a 2-year consecutive period, the mean occurrence rate is 1.52 storms. From eq. (1), the chance of no storms passing through the area is 0.22 and of at least one storm, 0.78. The chance of obtaining at least one storm over 5 consecutive years is 0.98.

5.4 Storm Translation Speeds

Mean storm translation speeds in each area are included in the tables under column E. The occurrence of speeds other than the mean can be accomplished by fitting the data to a statistical distribution. Since storm speeds are bounded at the lower end by zero but are theoretically unbounded at the upper end, the Gamma distribution may be expected to adequately describe the distribution of observed translation speeds. Properties of the distribution are described in detail by Crutcher et al. (1973, 1977, and 1978) and briefly by Burington and May (1958). The means and standard deviations of storm speeds given in columns E and F, respectively, are sufficient to provide moment estimates of the required shape and scale parameters of the Gamma distribution. Once the distribution has been fitted, inferences can be made as to the likelihood of storms moving through the area at speeds other than the mean.

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APPENDIX A — CHARTS AND TABLES

A.1 Introduction

Charts and tabular data depicting frequency and motion characteristics are presented for various portions of the hurricane season and for three wind speed criteria. Chart Series A (pp. A-3 through 44) is based on all tropical cyclone track segments having winds of at least tropical storm strength (1-minute sustained winds of at least 34 knots). Chart Series B (pp. A-45 through 53) and C (pp. A-55 through 57) are similar to Series A, except they are based on track segments having at least 64 knots (hurricane strength) and 100 knots, respectively. Because sample sizes decrease with increasing wind speed limits, the number of stratifications in each series is greater in the case of the smaller wind speed limits (20 stratifications are given for Chart Series A, four for Chart Series B, and one for Chart Series C).

A.2 Chart Descriptions

Charts and associated tabular data are arranged in pairs on facing pages as follows:

UPPER LEFT: The initial panel in each set of charts depicts storm frequency. Isolines are at intervals of three storms passing within 75 n.mi. per 100 years, except in the case of the 1 May - 30 Nov. and 16 Jul. - 20 Sep. periods of Chart Series A where isolines are at intervals of five storms per 100 years.

LOWER LEFT: The lower left panel gives the vector speed (knots) and direction (toward which storms are moving) averaged over 2 1/2-degree latitude/longitude boxes. Vector motions were not computed when frequencies were less than five storms per 80 years.

UPPER RIGHT: This panel gives specific storm tracks used in the computations. Solid lines depict portions of storm tracks meeting speed and temporal stratification criteria. Dashed portions refer to track segments that do not meet at least one of the criteria and, thus, are excluded from the computations.

LOWER RIGHT: Data used in construction of the upper-left and lower-left charts, as well as additional statistics for the given temporal and wind stratification, are tabulated on the lower portion of the right-hand page. Columnar headings A through F are identified as follows:

Column A: The index number of the 2 1/2-degree latitude/longitude box as specified in fig. 1

Column B: Expected number of tropical cyclones passing within 75 n.mi. (139 km) of given box center per 100 years

Column C: Resultant (vector) direction in degrees toward which the storm is expected to move on the average

Column D: Resultant (vector) speed in knots

Column E: Average translation speed without regard to direction (knots)

Column F: Standard deviation (knots) of column E data

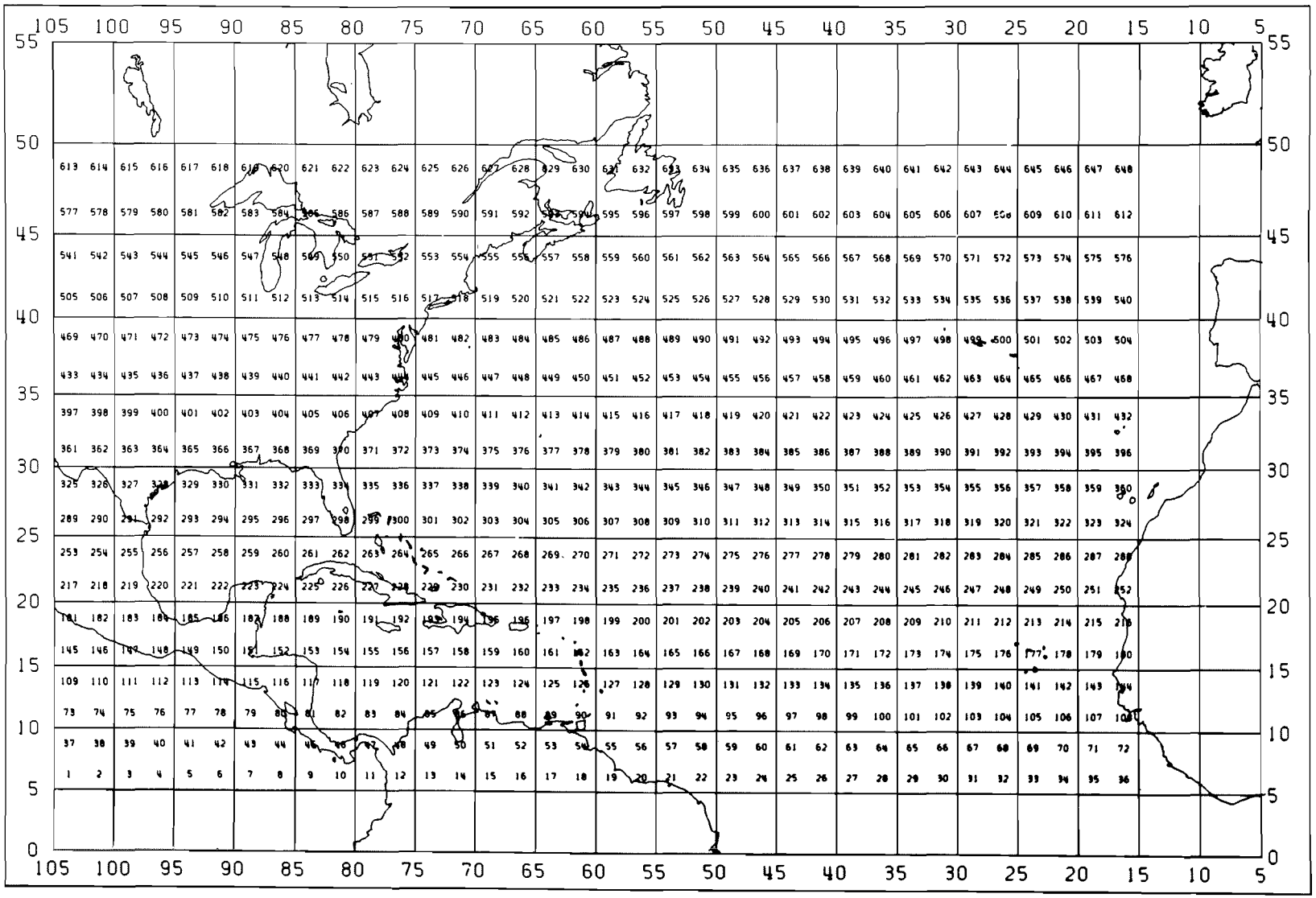
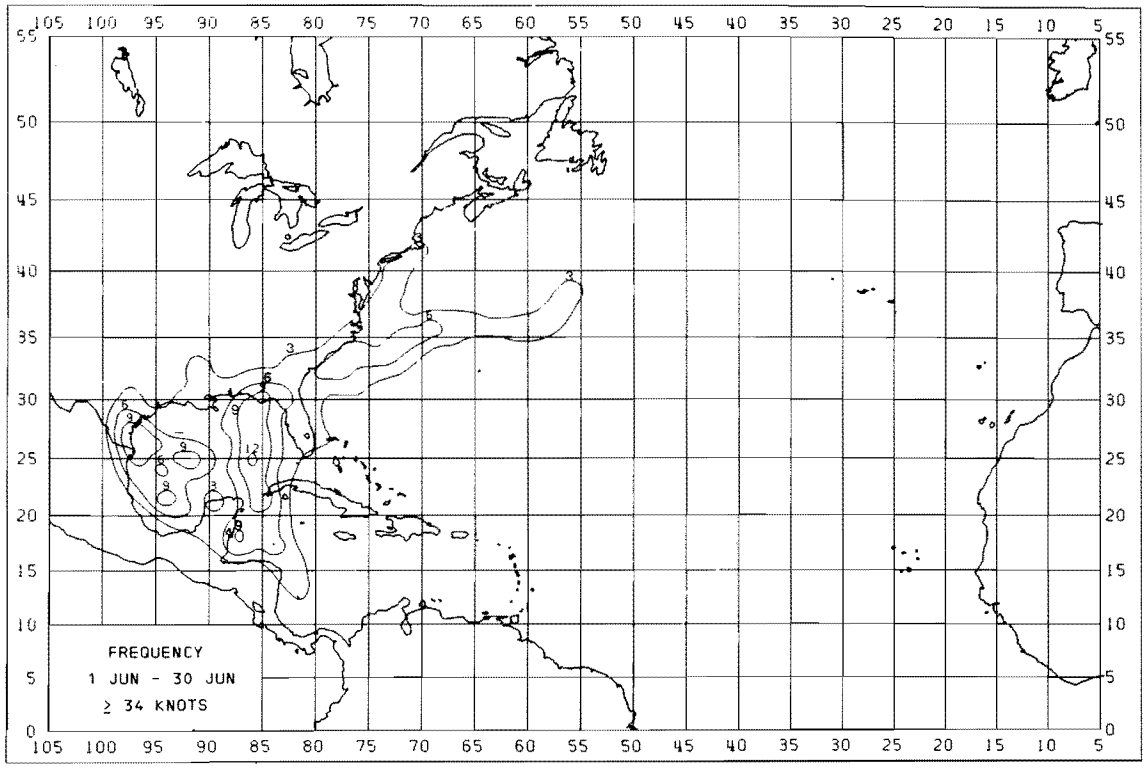


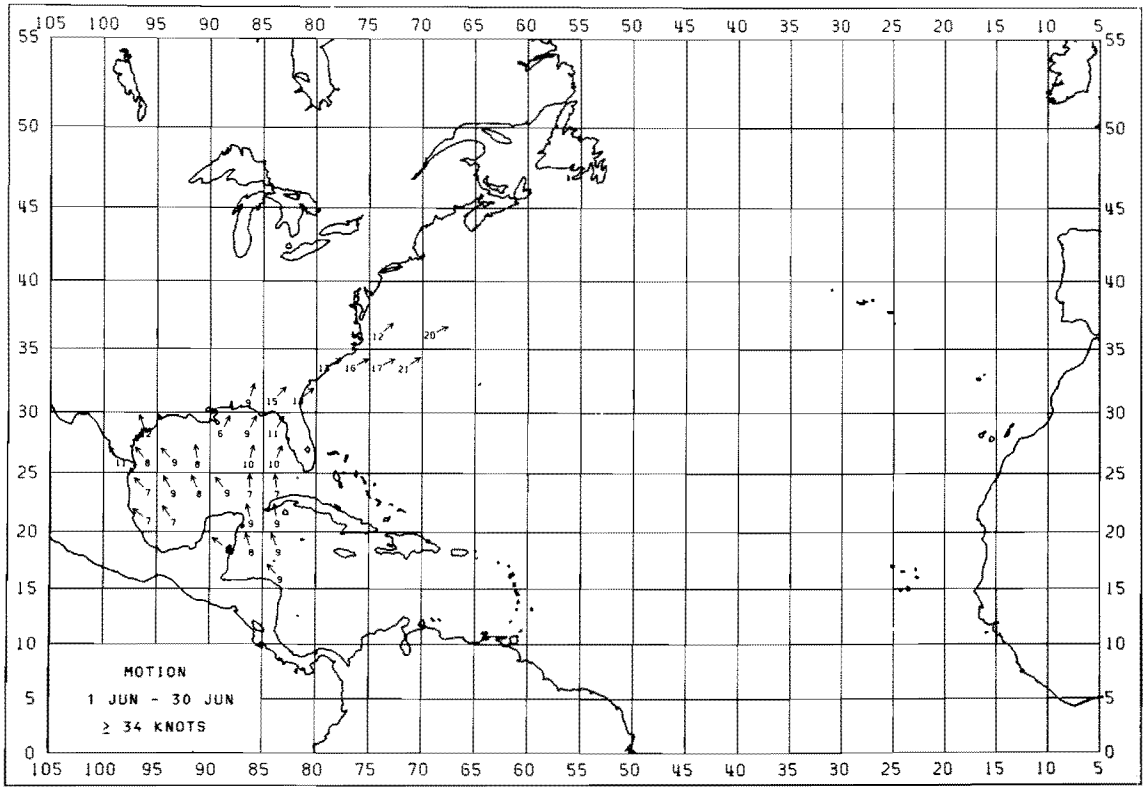
Figure 1.--Index numbers for 2 1/2-degree latitude/longitude boxes.

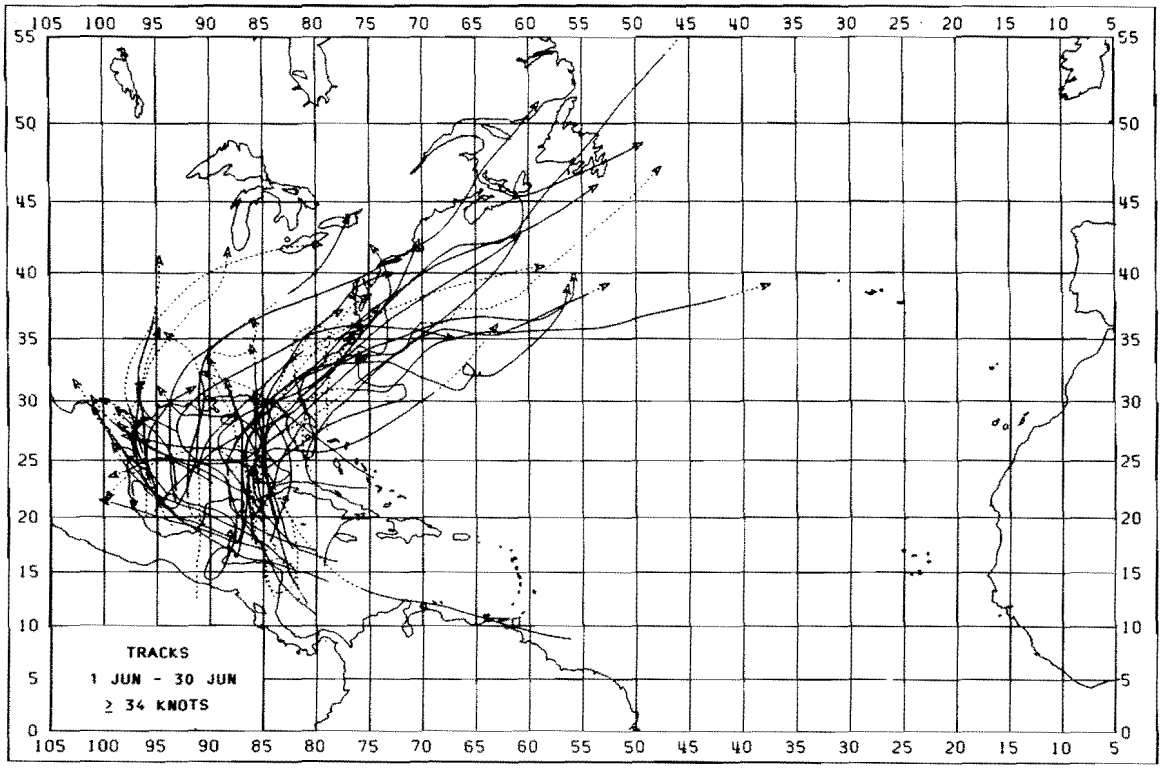
A.3 Chart Series A

Charts and tabular data in this series are based on portions of storm tracks having intensities of at least 34 knots and for the following periods:

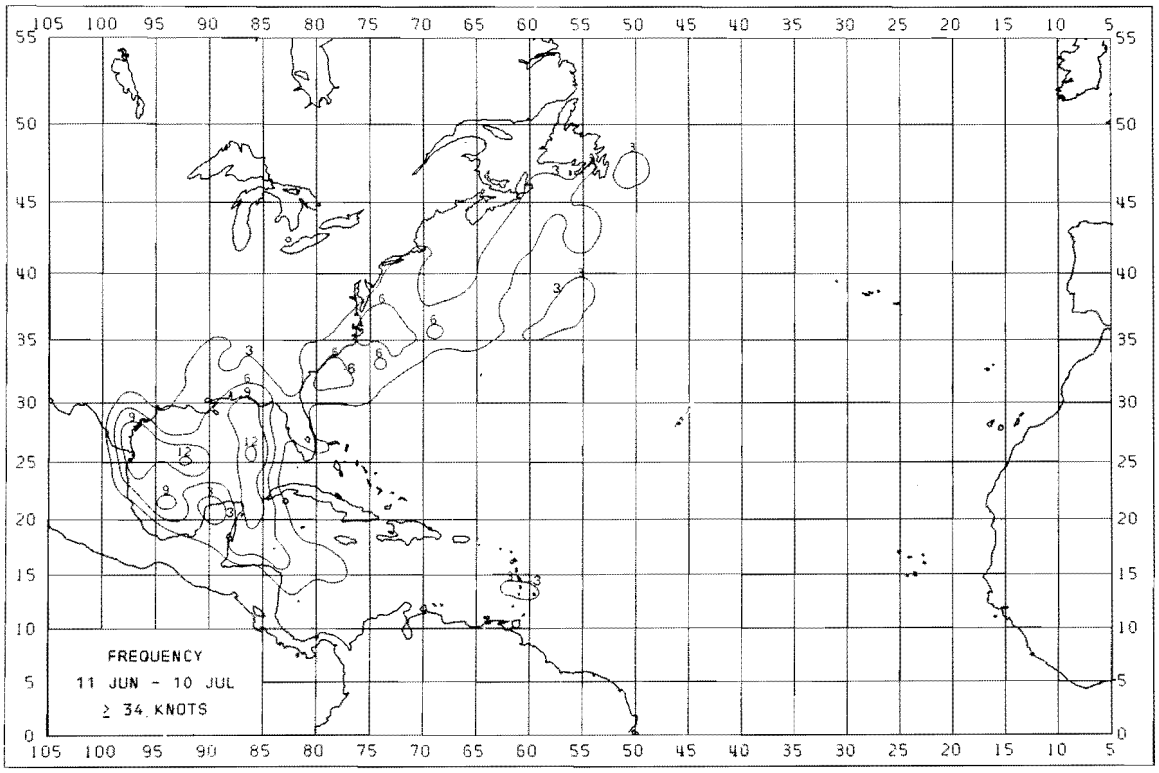
STRATIFICATION PERIOD	PAGES
1 Jun - 30 Jun	A-4,5
11 Jun - 10 Jul	A-6,7
21 Jun - 20 Jul	A-8,9
1 Jul - 31 Jul	A-10,11
11 Jul - 10 Aug	A-12,13
21 Jul - 20 Aug	A-14,15
1 Aug - 31 Aug	A-16,17
11 Aug - 10 Sep	A-18,19
21 Aug - 20 Sep	A-20,21
1 Sep - 30 Sep	A-22,23
11 Sep - 10 Oct	A-24,25
21 Sep - 20 Oct	A-26,27
1 Oct - 31 Oct	A-28,29
11 Oct - 10 Nov	A-30,31
21 Oct - 20 Nov	A-32,33
1 Nov - 30 Nov	A-34,35
1 May - 15 Jul	A-36,37
16 Jul - 20 Sep	A-38,39
21 Sep - 30 Nov	A-40,41
1 May - 30 Nov	A-42,44

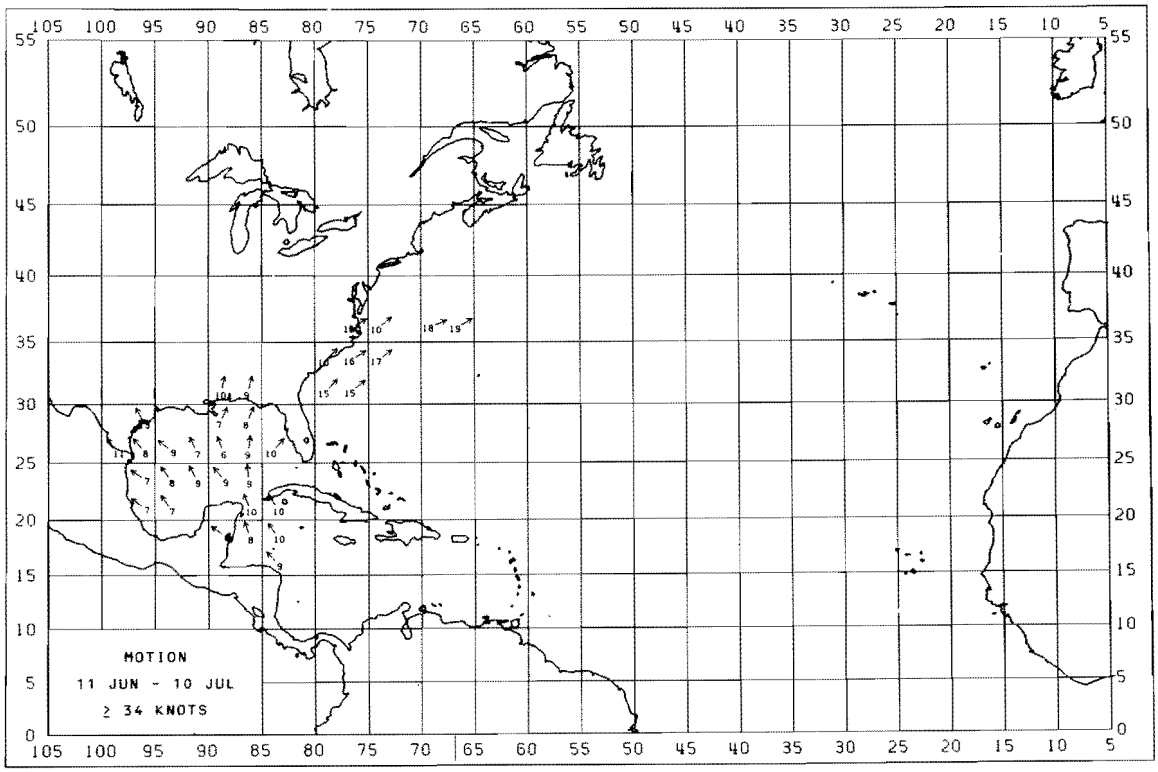

FREQUENCY
1 JUN - 30 JUN
≥ 34 KNOTS

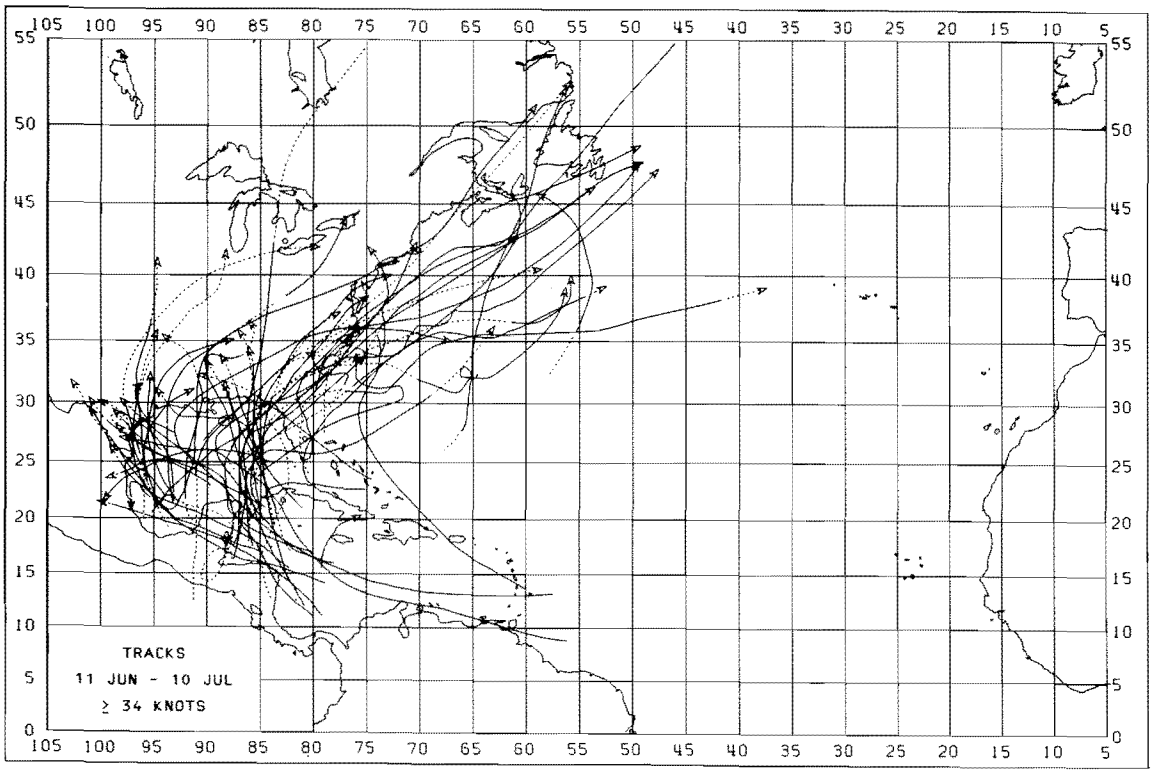

MOTION
1 JUN - 30 JUN
≥ 34 KNOTS



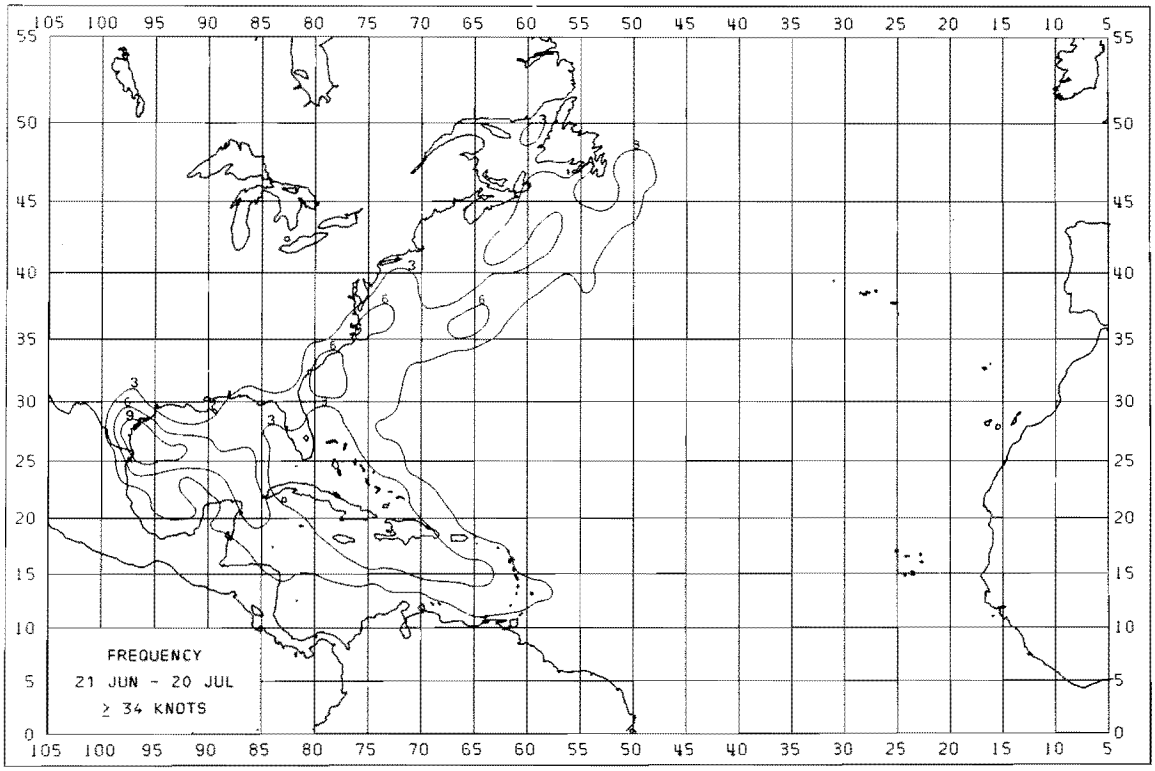
A	B	C	D	E	F
153	6	319	9	9	2.34
187	6	308	8	9	2.79
188	7	343	8	10	2.48
189	6	339	9	9	3.73
220	5	307	7	8	3.05
221	9	326	7	9	3.97
224	9	347	9	11	3.04
225	9	330	9	10	3.15
256	8	316	7	8	3.23
257	6	330	9	10	3.88
258	8	337	8	10	5.48
259	5	322	9	10	4.88
260	11	358	7	9	4.46
261	7	354	7	8	3.29
291	6	323	11	11	3.79
292	11	322	8	9	4.42
293	8	316	9	10	2.84
294	6	353	8	11	5.23
296	12	014	10	12	7.95
297	8	022	10	13	8.83
328	5	341	12	13	3.99
331	5	027	6	12	3.89
332	12	026	9	12	6.76
333	7	031	11	15	6.62
368	6	016	9	12	6.55
369	6	043	15	15	7.48
370	6	050	13	14	5.95
407	5	060	13	14	4.48
408	7	063	16	17	10.34
409	7	064	17	19	14.73
410	5	055	21	21	16.66
445	5	050	12	14	4.97
447	6	066	20	21	20.21

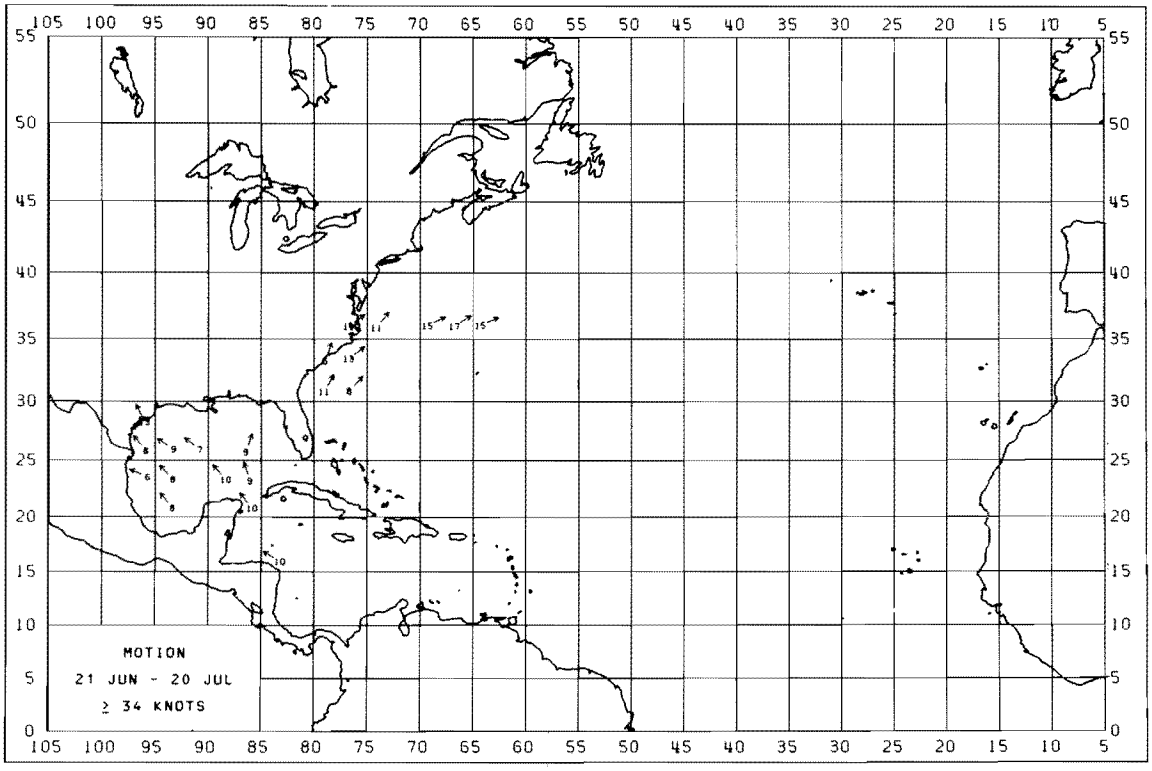

FREQUENCY
11 JUN - 10 JUL
≥ 34 KNOTS

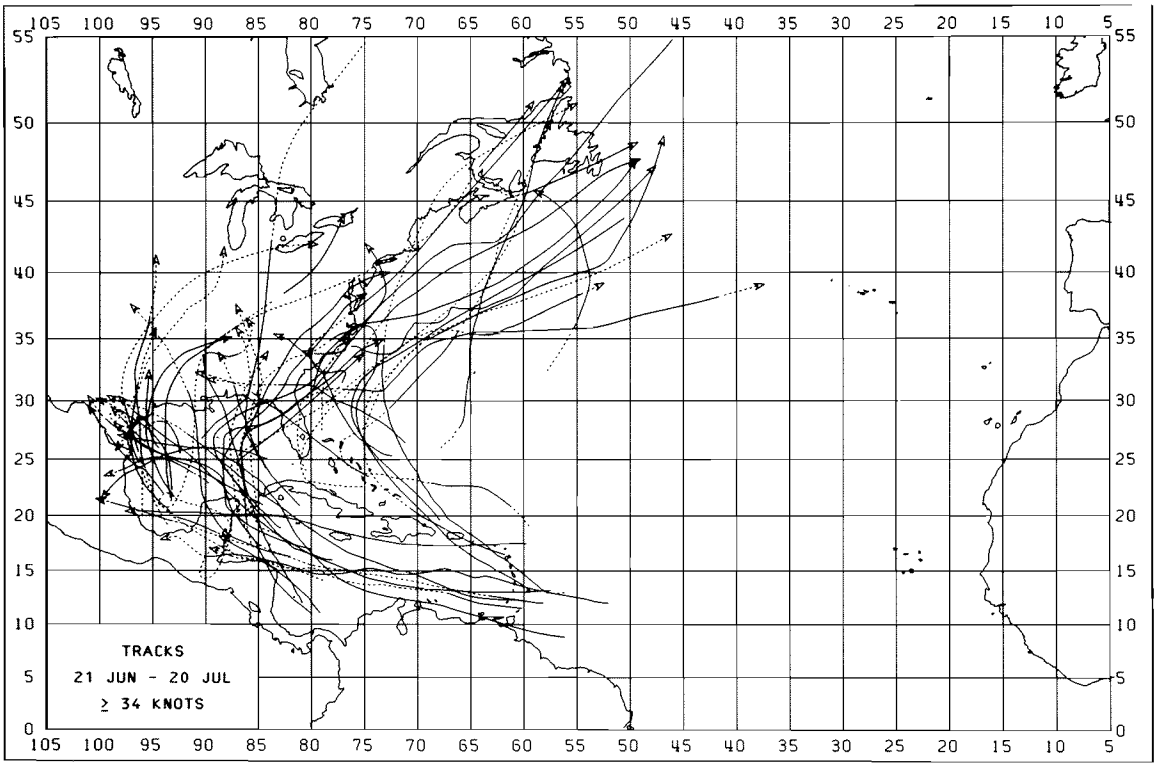

MOTION
11 JUN - 10 JUL
≥ 34 KNOTS



A	B	C	D	E	F
153	7	318	9	9	2.26
187	5	305	8	9	2.91
188	8	341	8	9	2.79
189	5	326	10	10	3.10
220	5	307	7	8	3.05
221	9	326	7	9	3.97
224	10	338	10	11	2.79
225	6	330	10	10	3.12
256	9	304	7	9	3.21
257	6	326	8	10	3.72
258	9	333	9	10	5.10
259	6	321	9	10	4.11
260	10	353	9	10	4.05
291	6	323	11	11	3.79
292	12	321	8	9	4.47
293	10	309	9	11	3.10
294	9	336	7	11	4.58
295	6	341	6	9	2.29
296	12	007	9	11	7.15
297	6	039	10	13	10.82
328	6	334	13	14	3.61
331	8	022	7	11	3.18
332	12	021	8	10	4.63
367	5	010	10	13	6.40
368	8	014	9	11	5.91
371	6	043	15	16	12.26
372	6	049	15	16	11.29
407	6	042	10	11	4.70
408	5	056	16	17	12.92
409	6	052	17	18	16.71
444	6	059	15	16	3.00
445	9	049	10	12	4.87
447	6	066	18	19	19.89
448	6	058	19	20	19.62


FREQUENCY
21 JUN - 20 JUL
≥ 34 KNOTS


MOTION
21 JUN - 20 JUL
≥ 34 KNOTS



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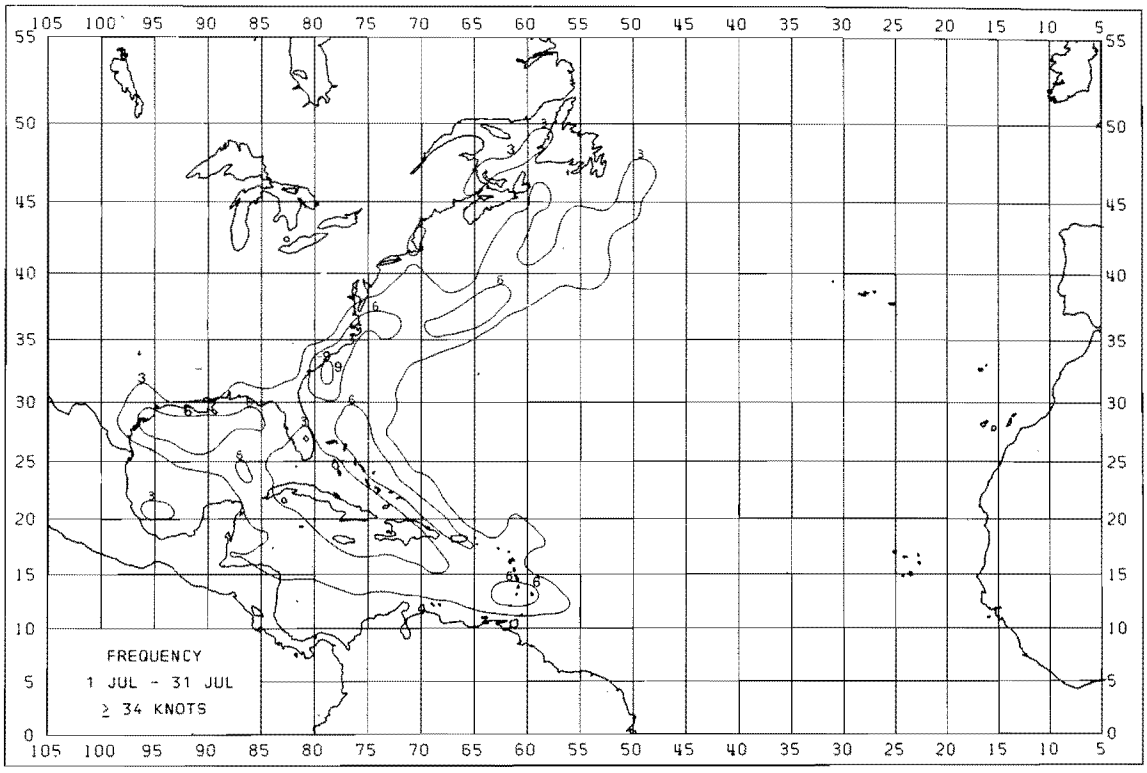
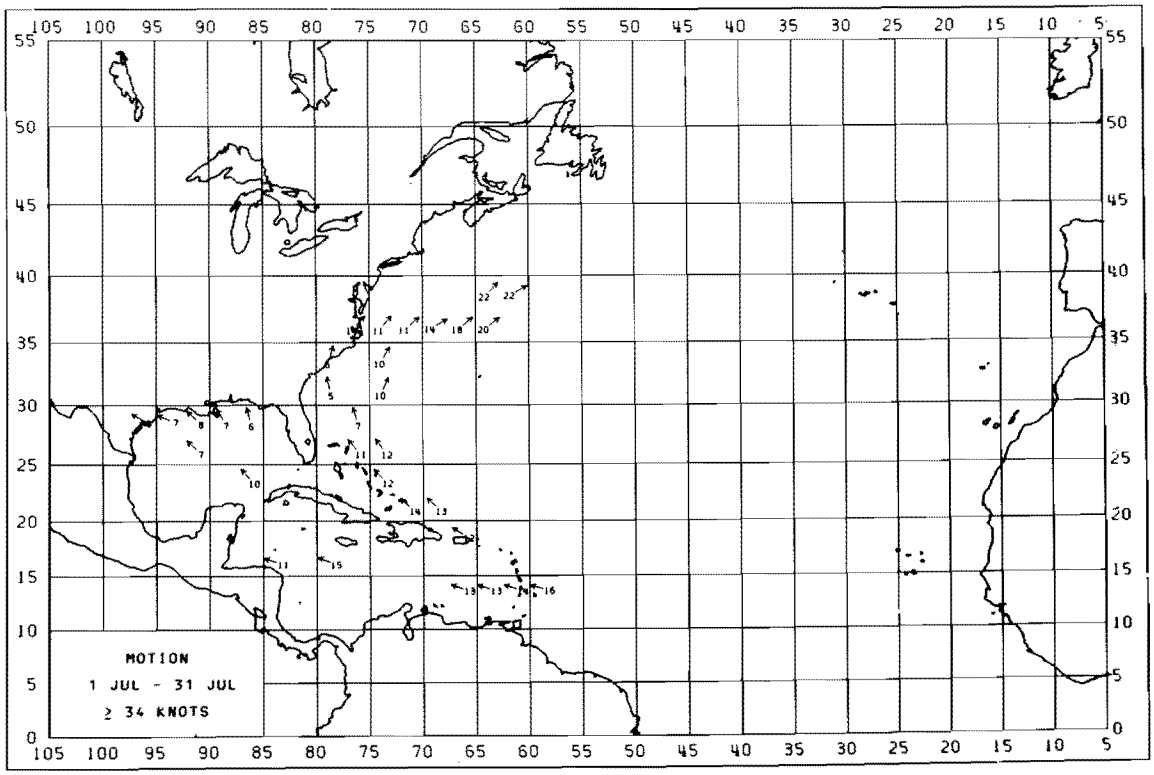
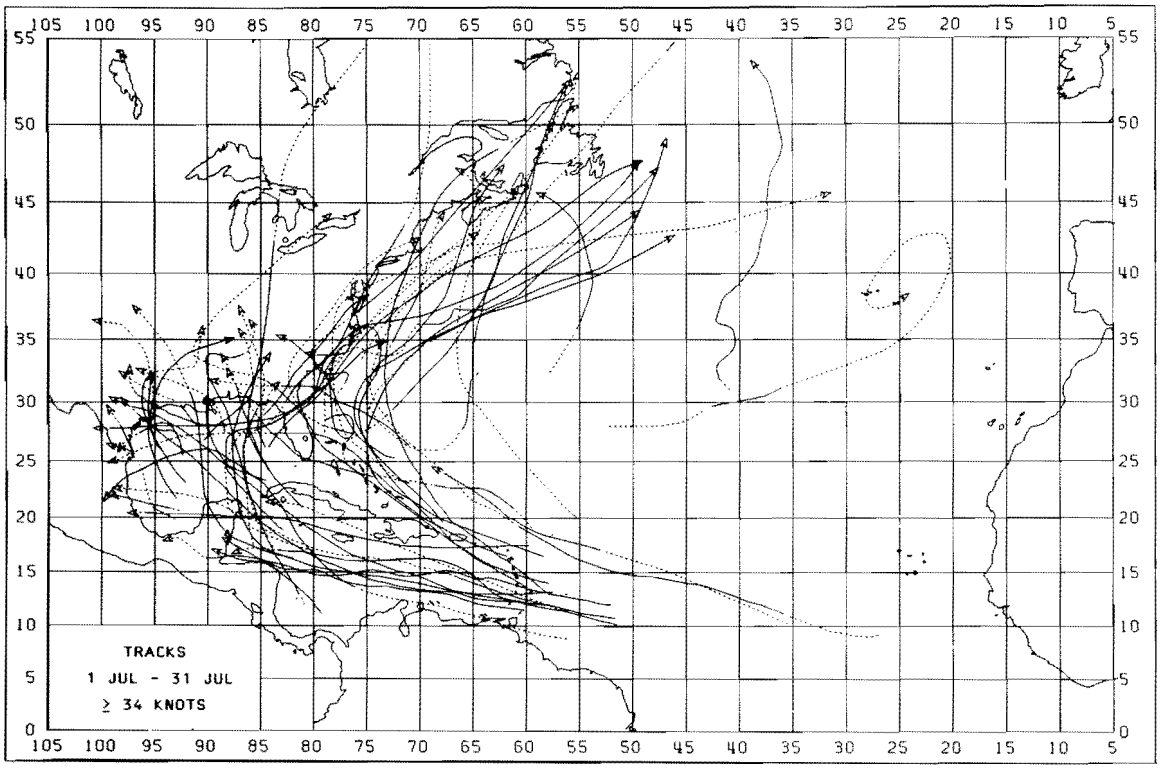
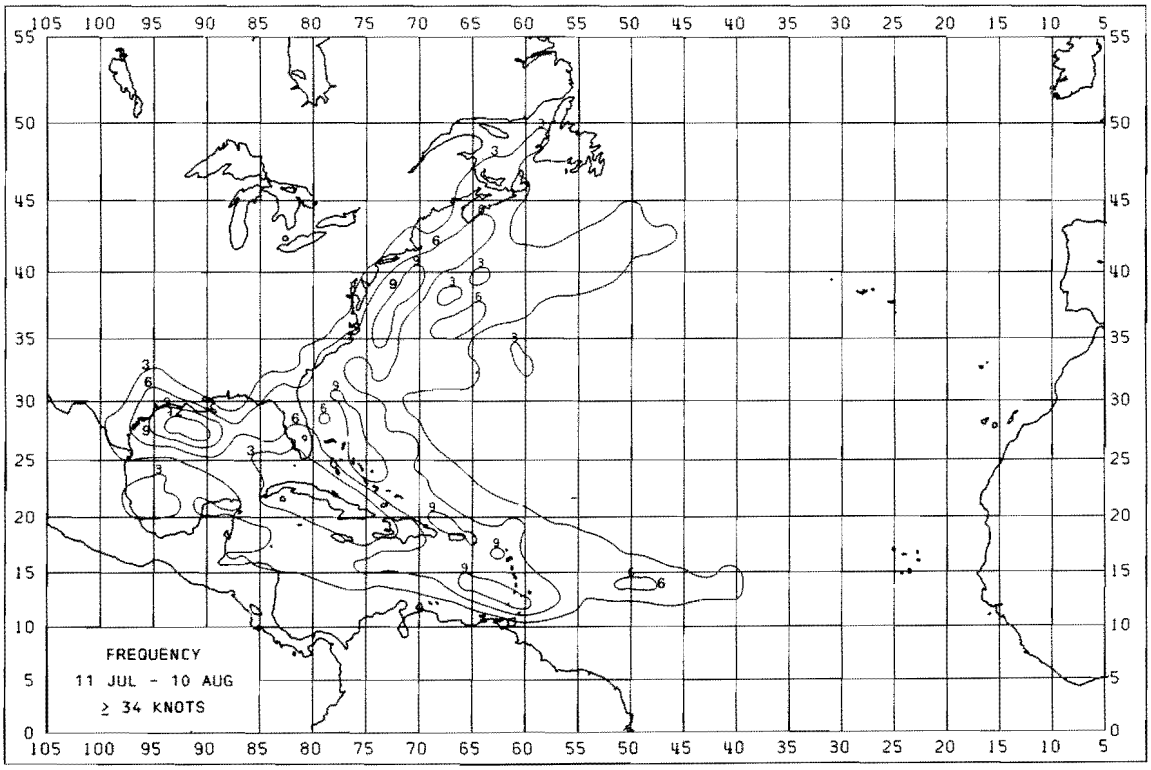
153	5	301	10	10	3.47
221	5	321	8	10	4.59
224	8	321	10	11	2.12
256	6	293	6	8	2.77
257	5	317	8	10	2.63
259	6	319	10	11	3.13
260	8	342	9	11	4.34
292	11	321	8	9	4.47
293	9	303	9	10	3.08
294	8	308	7	9	3.17
296	6	018	9	12	10.47
328	6	334	13	14	3.61
371	8	029	11	14	10.56
372	5	042	8	10	8.73
407	7	018	6	9	4.60
408	5	052	13	16	14.23
444	6	052	11	14	5.08
445	7	038	11	12	4.17
447	5	063	15	15	7.37
448	8	056	17	18	8.88
449	7	066	15	16	8.05

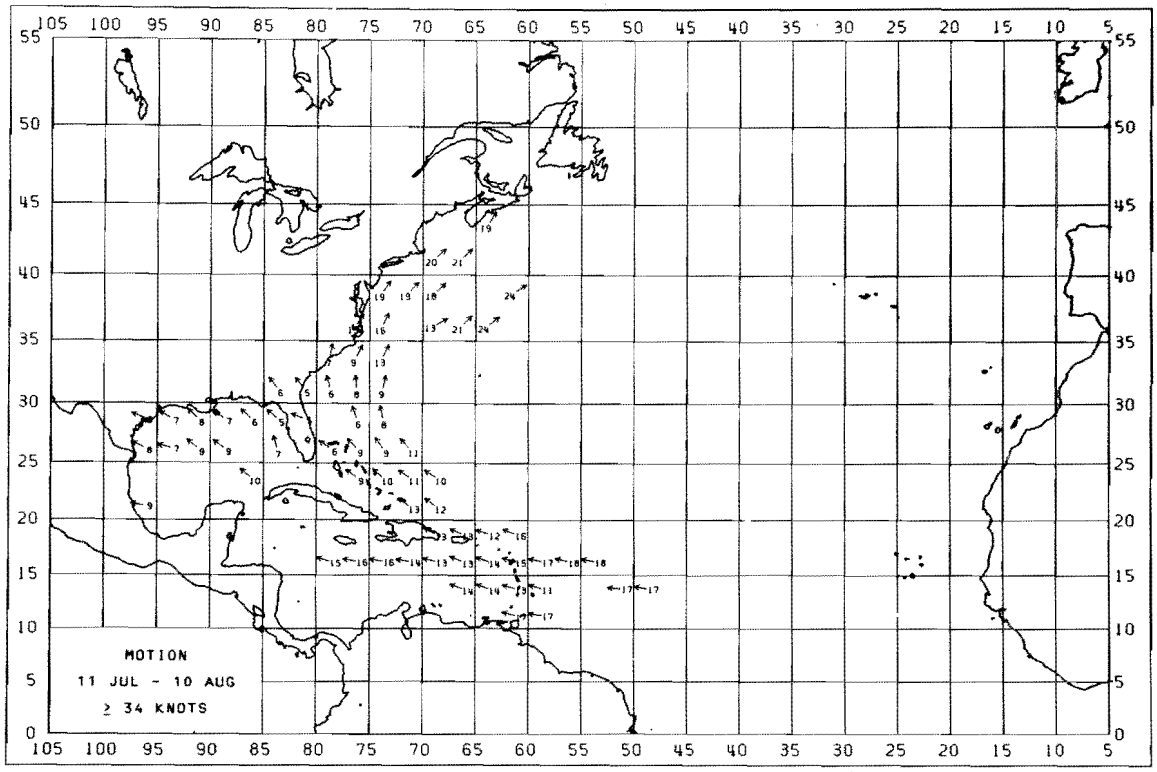

FREQUENCY
1 JUL - 31 JUL
≥ 34 KNOTS

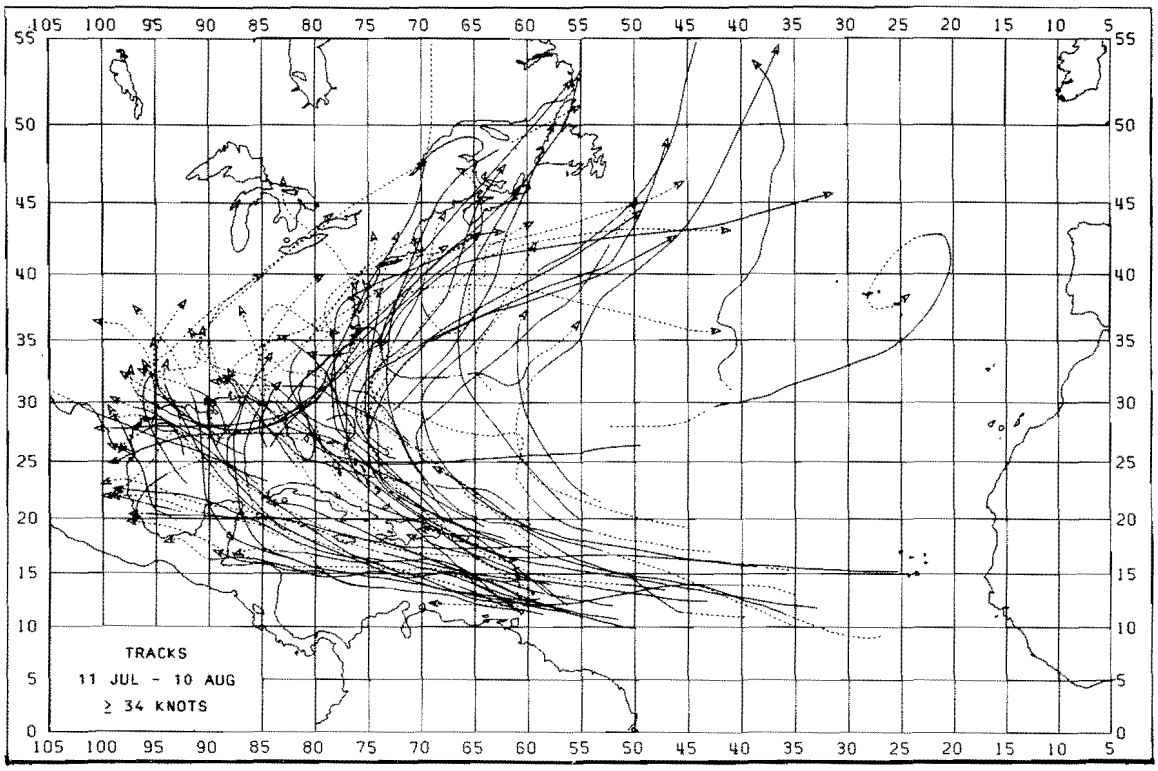

MOTION
1 JUL - 31 JUL
≥ 34 KNOTS



A	B	C	D	E	F
124	6	288	13	13	4.96
125	5	287	13	13	4.31
126	7	288	14	14	4.35
127	6	286	16	16	8.60
153	6	289	11	11	3.54
155	6	292	15	16	4.08
196	6	302	12	12	3.62
230	6	310	14	14	5.27
231	5	313	13	13	6.84
260	6	318	10	11	3.09
265	8	315	12	12	4.72
294	7	314	7	10	3.56
300	8	320	11	12	6.00
301	5	325	12	13	3.98
328	7	299	9	11	4.53
329	6	292	7	7	2.34
330	6	314	8	10	4.09
331	7	331	7	11	2.81
332	7	346	6	10	2.20
336	8	345	7	10	3.96
371	8	347	5	9	3.64
373	5	023	10	11	3.85
407	9	015	5	9	6.57
409	5	031	10	11	2.51
444	7	041	14	16	8.00
445	7	041	11	13	7.26
446	5	049	11	12	6.39
447	7	060	14	14	5.74
448	7	050	18	19	9.81
449	7	052	20	21	10.84
485	5	042	22	24	11.12
486	6	061	22	23	8.65

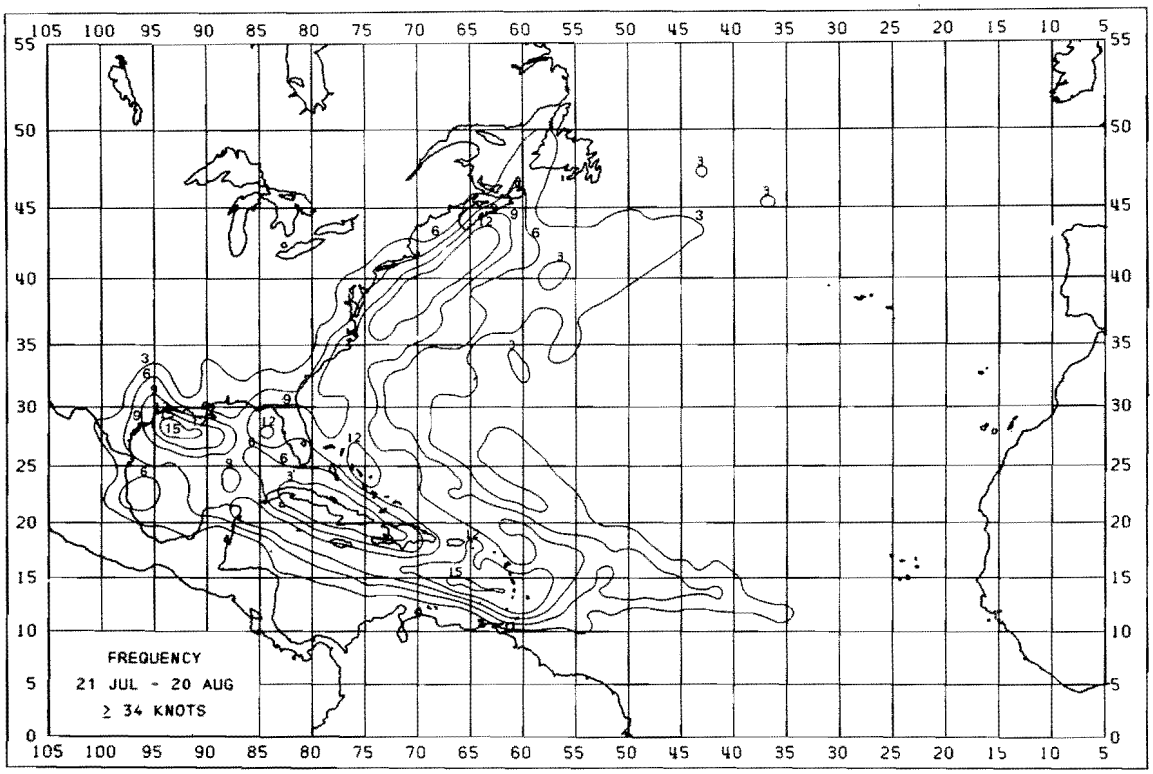

FREQUENCY
11 JUL - 10 AUG
≥ 34 KNOTS

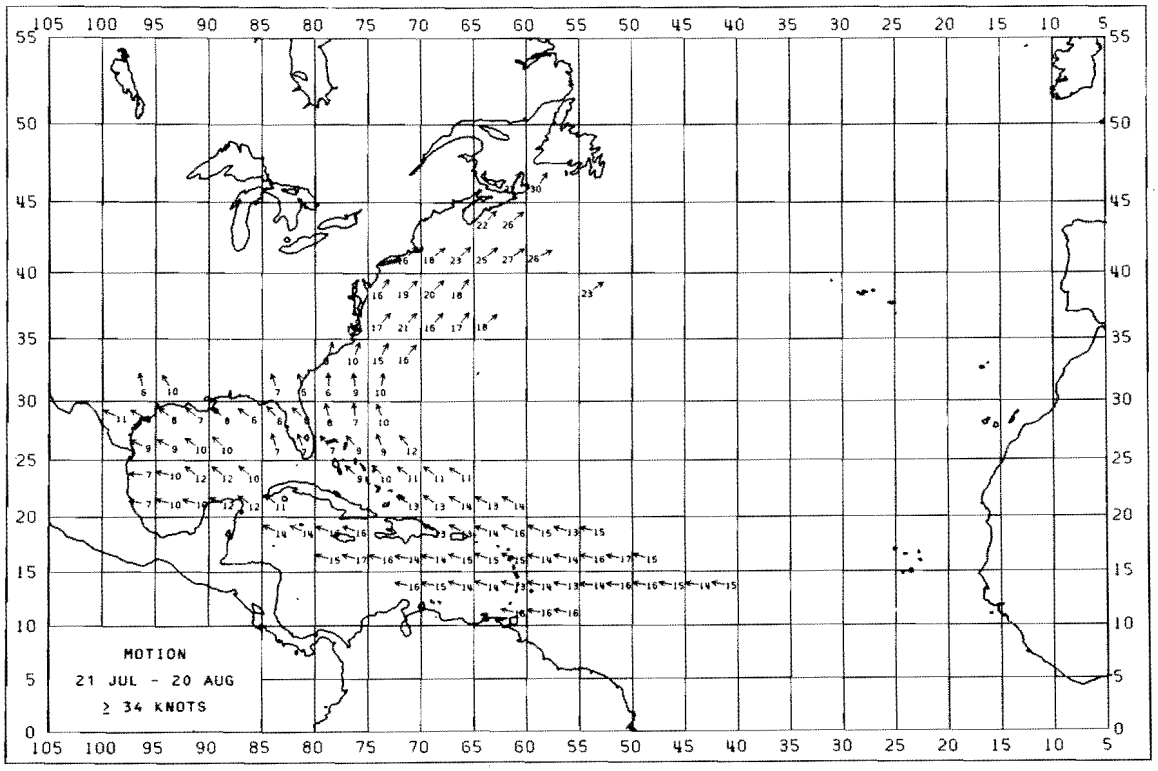

MOTION
11 JUL - 10 AUG
≥ 34 KNOTS



A	B	C	D	E	F
90	6	285	17	17	4.95
91	6	278	17	17	6.53
124	10	291	14	15	5.27
125	10	290	14	15	4.27
126	9	287	13	14	4.02
127	7	286	11	12	3.77
130	7	275	17	17	3.96
131	7	279	17	17	2.21
155	6	287	15	15	5.67
156	6	281	16	16	6.39
157	7	281	16	16	6.12
158	7	279	14	14	6.09
159	7	283	13	13	4.45
160	8	292	13	14	2.41
161	7	289	14	15	2.68
162	7	285	15	15	3.14
163	5	283	17	17	3.66
164	5	283	18	19	5.65
165	5	281	18	18	3.85
195	8	298	13	13	2.20
196	9	293	13	13	3.76
197	7	288	12	13	4.01
198	7	290	16	16	5.44
220	5	279	9	11	3.12
230	7	305	13	13	2.07
231	8	306	12	12	4.41
260	5	311	10	11	3.41
264	7	308	9	9	2.43
265	10	311	10	11	2.98
266	7	304	11	12	2.96
267	6	304	10	10	2.82
292	6	297	8	10	2.62
293	6	285	7	9	3.17
294	8	310	9	10	3.78
295	7	307	9	10	4.08
297	5	345	7	9	3.37
299	7	305	6	6	1.63
300	10	317	9	10	5.19
301	8	324	9	10	4.08
302	7	318	11	12	7.28
328	8	291	9	10	3.97
329	13	300	7	8	3.58
330	11	313	8	9	4.32
331	6	301	7	10	4.03
332	7	313	6	8	2.78
333	7	310	5	10	3.72
334	8	290	5	10	4.09
336	10	342	6	8	2.69
337	7	348	8	9	3.88
369	6	324	6	8	3.37
370	5	322	5	12	3.74
371	9	345	6	10	3.80
372	6	356	8	9	4.22

A	B	C	D	E	F
373	6	011	9	10	4.72
407	8	010	7	11	7.32
408	6	026	9	12	6.43
409	8	025	13	14	7.09
444	5	031	13	16	9.67
445	10	026	16	18	8.00
447	7	060	13	15	5.87
448	6	044	21	23	7.21
449	5	051	24	25	8.54
481	6	034	19	20	5.44
482	10	042	19	21	8.68
483	5	047	18	20	11.40
486	5	056	24	26	6.79
519	7	046	20	20	6.78
520	7	046	21	22	7.27
557	6	031	19	21	10.04


FREQUENCY
21 JUL - 20 AUG
≥ 34 KNOTS


MOTION
21 JUL - 20 AUG
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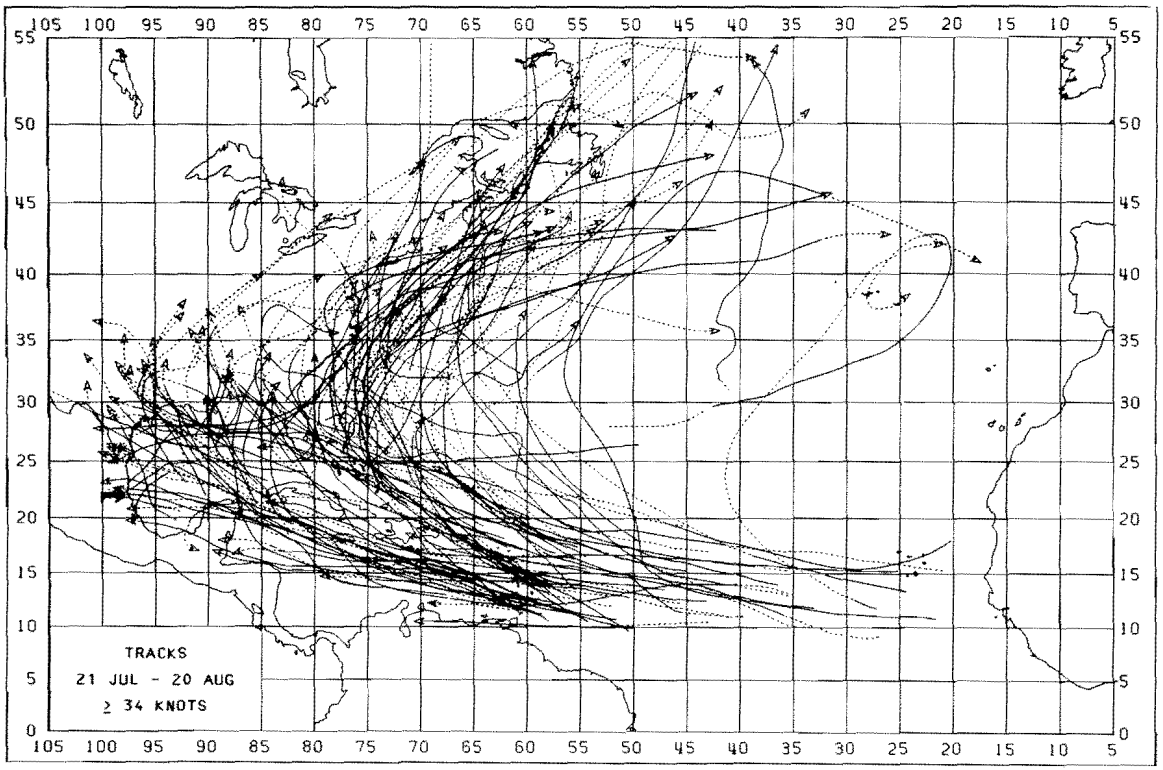

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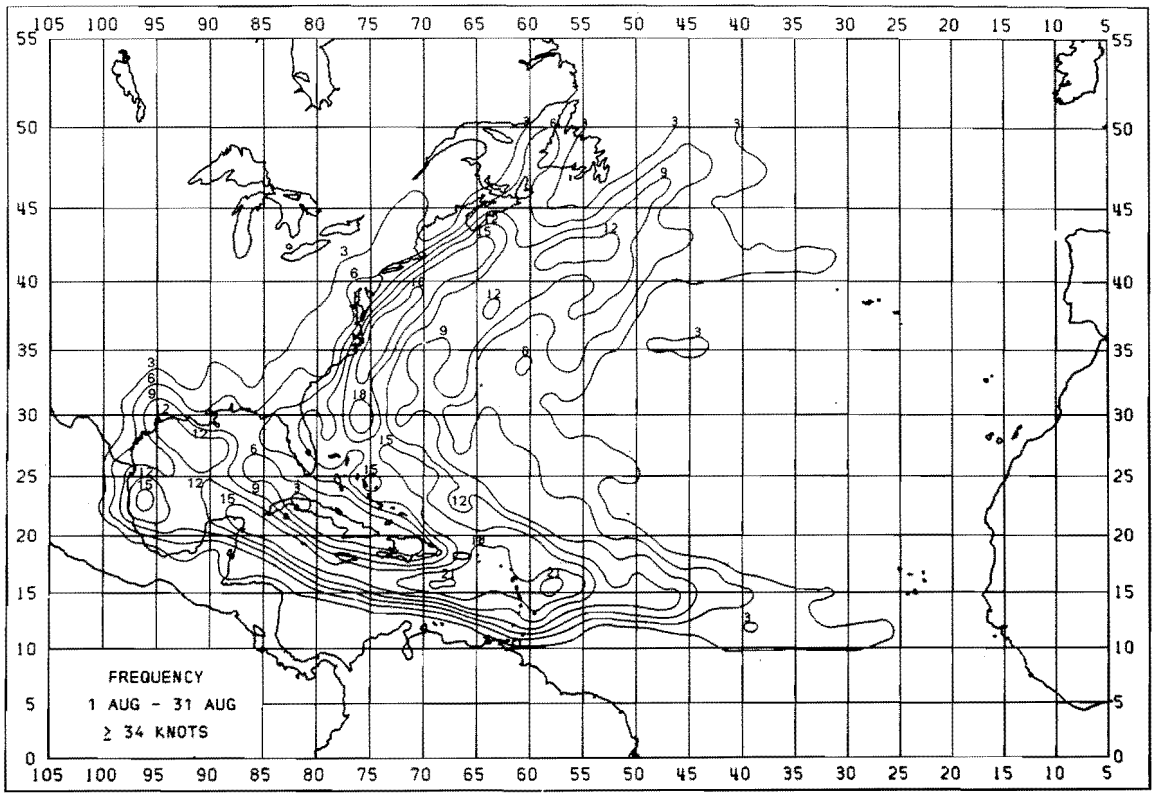
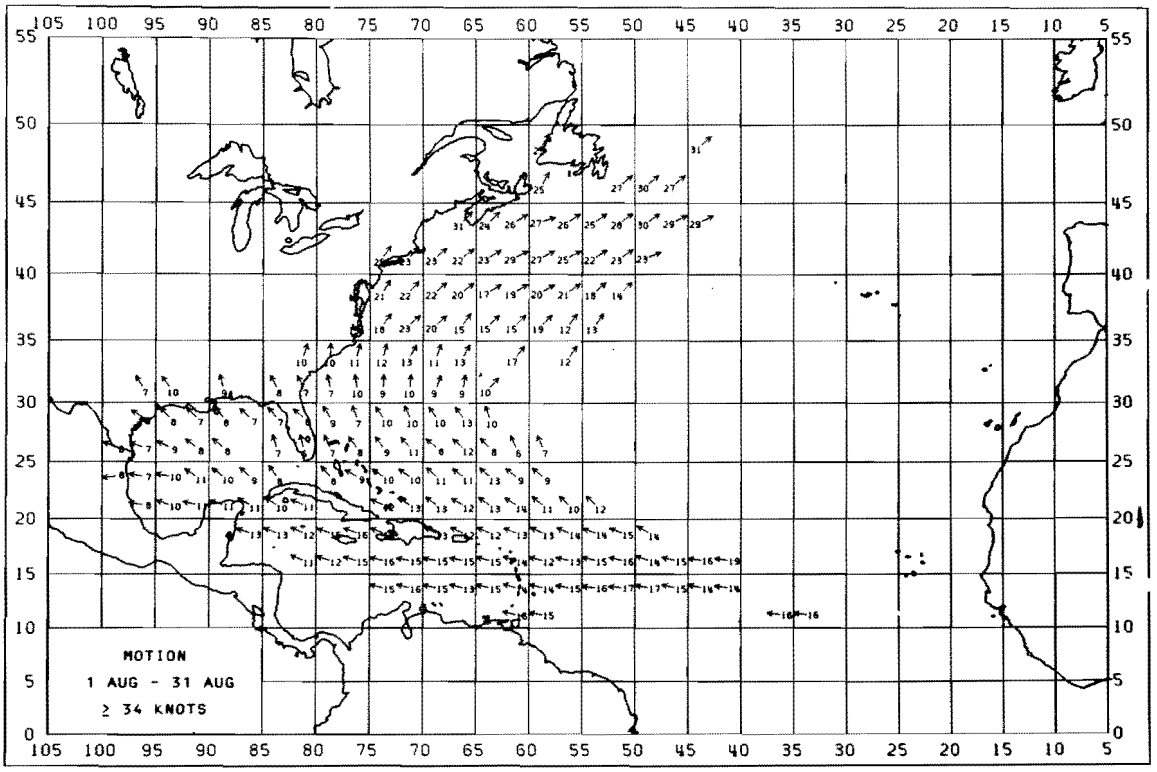
91	9	279	16	16	5.74
92	6	280	16	16	6.63
122	5	283	16	16	6.78
123	7	281	15	16	6.14
124	14	287	14	14	4.92
125	15	288	14	14	3.75
126	15	286	13	14	3.04
127	14	285	14	14	3.74
128	8	281	13	14	4.12
129	6	276	14	14	3.29
130	8	276	16	17	3.67
131	7	279	16	17	2.26
132	7	280	15	15	2.41
133	6	278	14	15	1.75
134	6	279	15	15	2.11
155	7	286	15	15	5.92
156	10	285	17	17	6.04
157	11	284	16	16	5.72
158	11	281	14	14	5.78
159	13	283	14	15	5.98
160	13	287	15	15	4.51
161	12	290	15	16	3.24
162	10	290	15	15	1.62
163	10	285	14	14	4.82
164	10	284	14	15	6.47
165	8	284	16	16	4.34
166	6	282	17	17	4.36
167	7	287	15	16	5.08
189	7	295	14	14	4.60
190	11	294	14	14	3.84
191	9	289	16	16	3.97
192	6	289	16	16	2.42
195	8	299	13	13	2.67
196	11	298	13	14	2.66
197	9	291	14	14	3.52
198	9	294	16	16	5.11
199	9	294	15	15	5.69
200	7	287	13	13	2.09
201	6	284	15	16	4.17
220	6	280	7	9	3.21
221	6	286	10	10	3.14
222	7	285	10	11	2.79
223	8	293	12	12	3.99
224	11	305	12	13	4.11
225	6	306	11	11	3.74
230	8	302	13	13	2.61
231	11	306	13	13	3.34
232	7	300	14	14	5.50
233	7	299	13	14	7.58
234	6	298	14	15	5.99
256	6	273	7	9	2.76
257	6	283	10	12	7.18

A	B	C	D	E	F
258	7	308	12	12	5.31
259	8	309	12	13	3.80
260	8	310	10	10	3.37
264	9	313	9	10	2.58
265	12	316	10	11	3.16
266	10	306	11	12	4.16
267	8	306	11	11	4.82
268	6	300	11	11	6.34
292	8	295	9	10	4.08
293	8	299	9	11	4.90
294	10	307	10	11	3.49
295	10	314	10	11	3.69
297	7	344	7	9	2.84
298	6	341	7	10	5.22
299	10	322	7	8	4.38
300	12	320	9	10	4.50
301	10	339	9	11	5.16
302	10	323	12	13	7.95
327	5	295	11	12	3.45
328	10	296	9	10	3.53
329	17	308	8	9	3.92
330	12	311	7	9	4.67
331	9	311	8	9	3.76
332	8	306	6	8	2.48
333	11	320	6	9	2.99
334	11	310	6	10	3.75
335	6	347	8	9	4.41
336	10	355	7	8	2.80
337	7	341	10	11	4.31
364	7	346	6	7	2.27
365	6	328	10	11	5.25
369	7	342	7	9	3.33
370	6	342	5	12	4.03
371	10	359	6	10	3.93
372	9	352	9	10	2.97
373	9	007	10	11	4.04
407	7	016	8	12	7.03
408	11	019	10	11	5.29
409	9	029	15	16	6.44
410	8	039	16	17	7.73
444	8	028	14	14	8.39
445	14	042	17	19	7.43
446	11	040	21	22	8.81
447	11	041	16	18	7.67
448	8	038	17	19	9.20
449	5	049	18	19	11.90
481	7	034	16	17	7.25
482	14	045	19	20	8.98
483	14	044	20	22	9.37
484	9	036	18	20	8.79
489	6	053	23	25	3.89
518	6	046	16	18	6.13
519	9	053	18	19	5.68

A	B	C	D	E	F
520	15	048	23	24	8.34
521	12	051	25	27	14.97
522	8	056	27	29	15.69
523	6	066	26	27	14.73
557	12	044	22	23	11.34
558	9	049	26	27	10.33
594	6	032	27	28	8.59
595	5	034	30	31	10.75


FREQUENCY
1 AUG - 31 AUG
≥ 34 KNOTS


MOTION
1 AUG - 31 AUG
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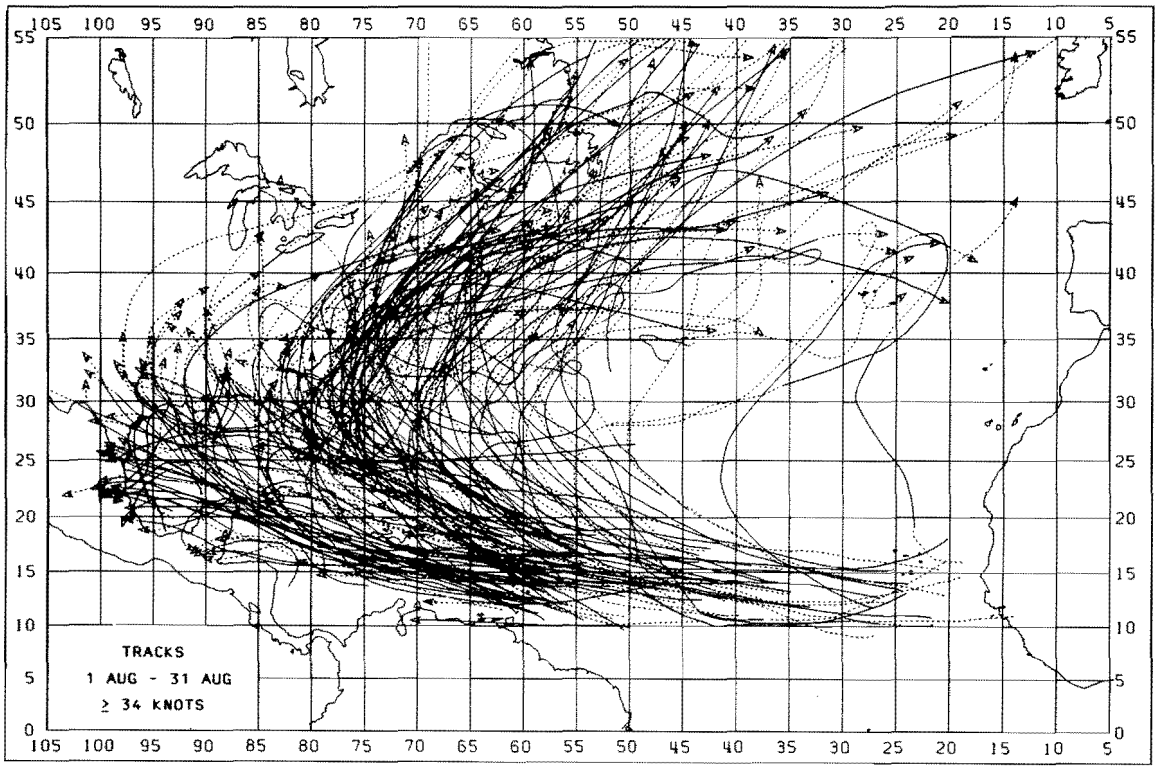

A	B	C	D	E	F
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91	8	278	15	16	4.59
100	5	277	16	16	3.23
101	5	276	16	16	2.87
121	6	284	15	15	5.26
122	7	285	16	16	6.06
123	10	282	15	15	5.66
124	17	284	13	13	5.69
125	17	283	15	15	4.26
126	16	287	14	14	4.14
127	17	284	14	14	5.56
128	12	280	15	15	4.68
129	12	277	16	16	4.42
130	13	275	17	17	3.97
131	12	280	17	17	3.10
132	12	282	15	16	3.16
133	8	283	14	14	2.17
134	6	277	14	14	2.96
154	7	293	11	12	4.74
155	13	288	12	13	5.30
156	15	286	15	15	5.12
157	17	283	16	16	5.07
158	19	280	15	15	5.48
159	20	280	15	15	5.45
160	20	281	15	15	4.87
161	20	284	15	15	4.14
162	19	287	14	14	4.69
163	20	284	12	12	4.44
164	19	282	13	13	5.16
165	14	284	15	15	5.27
166	11	283	16	17	4.62
167	11	289	14	15	4.31
168	9	283	15	15	4.62
169	8	278	16	16	5.21
170	5	278	19	19	9.74
188	7	288	13	14	2.14
189	13	292	13	13	4.09
190	18	294	12	13	3.95
191	11	290	15	15	4.59
192	9	291	16	16	3.91
193	6	291	15	15	2.84
195	8	297	13	14	3.06
196	15	296	12	13	2.85
197	19	294	12	13	3.80
198	16	292	13	14	3.58
199	15	295	13	13	4.07
200	11	293	14	15	3.01
201	11	289	14	14	4.10
202	7	291	15	16	5.24
203	7	302	14	15	5.84
220	11	279	8	10	3.67
221	12	289	10	10	3.87
222	11	283	11	12	2.99
223	14	288	11	12	3.10
224	17	301	11	12	3.80
225	13	303	10	11	3.36
226	5	293	11	12	4.26
229	5	294	12	12	4.05
230	9	301	13	13	4.46
231	18	307	13	13	3.86
232	15	300	12	12	5.35
233	14	305	13	13	5.92
234	12	303	14	14	5.05
235	7	309	11	12	5.76
236	7	312	10	11	3.59
237	6	313	12	12	4.97
255	6	261	8	9	3.96
256	15	280	7	9	2.39
257	10	280	10	10	5.65
258	11	303	11	12	4.34
259	12	307	10	11	3.77
260	8	312	9	9	2.70
261	6	326	8	9	2.61
263	7	321	8	9	1.83
264	11	301	9	10	3.22
265	14	304	10	11	2.94
266	15	304	10	11	4.70
267	13	311	11	12	5.49
268	12	306	11	11	6.17
269	8	311	13	13	4.21
270	7	308	9	10	4.45
271	6	310	9	9	4.80
291	7	292	8	9	3.29
292	9	291	7	9	4.65
293	9	296	9	11	5.22
294	13	308	8	9	4.16
295	12	311	8	9	3.24
297	6	343	7	10	4.00
298	9	347	6	11	4.15
299	13	336	7	9	4.20
300	11	324	8	9	3.10
301	14	324	9	10	4.47
302	17	318	11	12	6.76
303	10	310	8	9	3.97
304	6	309	12	13	4.88
305	8	315	8	11	4.53
306	8	335	6	10	3.42
307	5	336	7	13	1.80
328	9	304	8	9	4.00
329	15	319	8	9	4.01
330	10	317	7	8	4.42
331	9	327	8	10	3.75
332	7	313	7	9	3.28
333	10	321	7	9	1.82
334	13	312	8	10	3.39
335	11	331	9	10	3.77
336	19	342	7	9	4.23
337	13	325	10	11	4.35
338	10	338	10	12	4.34
339	10	326	10	12	3.85
340	6	325	13	15	3.50
341	8	341	10	12	4.97
364	8	332	7	7	2.25
365	9	326	10	11	4.07
367	5	347	9	10	4.48
369	8	334	8	9	3.76
370	7	334	7	8	2.94
371	13	350	7	9	4.06
372	17	354	10	11	3.95
373	13	003	9	11	3.90
374	10	005	10	12	7.59
375	8	019	9	11	5.63
376	7	009	9	13	4.99
377	6	041	10	13	5.38
406	6	016	10	11	5.09
407	6	003	10	11	4.99
408	19	015	11	12	5.07
409	14	014	12	14	6.33
410	8	029	13	16	8.21
411	8	019	11	13	6.26
412	10	028	13	14	4.19
414	6	039	17	18	6.35
416	6	036	12	15	6.02
444	11	021	13	14	8.52
445	20	036	18	19	6.95
446	13	049	23	24	8.19
447	12	049	20	22	8.23
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450	5	046	15	15	8.24
451	5	044	19	19	8.45
452	8	036	12	13	6.61
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480	6	024	15	17	6.48
481	11	032	21	22	8.28
482	18	042	22	23	8.73
483	14	050	22	24	9.83
484	12	053	20	22	9.18
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486	11	059	19	21	9.49
487	7	060	20	22	10.79
488	9	055	21	23	10.12
489	10	050	18	20	7.92
490	8	047	14	16	10.33
517	6	034	25	26	11.83
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519	14	049	23	24	11.63
520	17	053	22	23	9.37
521	13	060	23	25	15.37
522	9	064	29	30	15.84
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525	11	059	22	24	8.67
526	10	055	23	26	8.82
527	6	069	23	25	7.97
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558	9	059	26	27	9.94
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595	5	029	25	27	10.83
598	6	050	27	29	8.70
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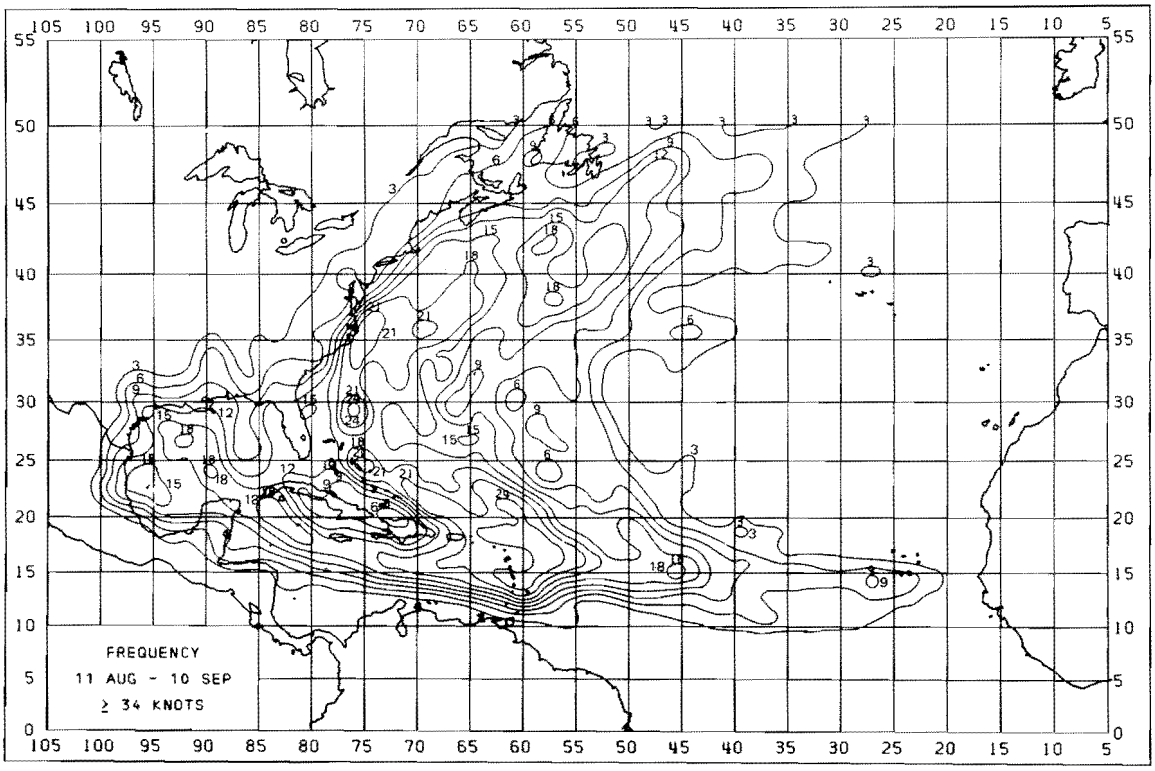
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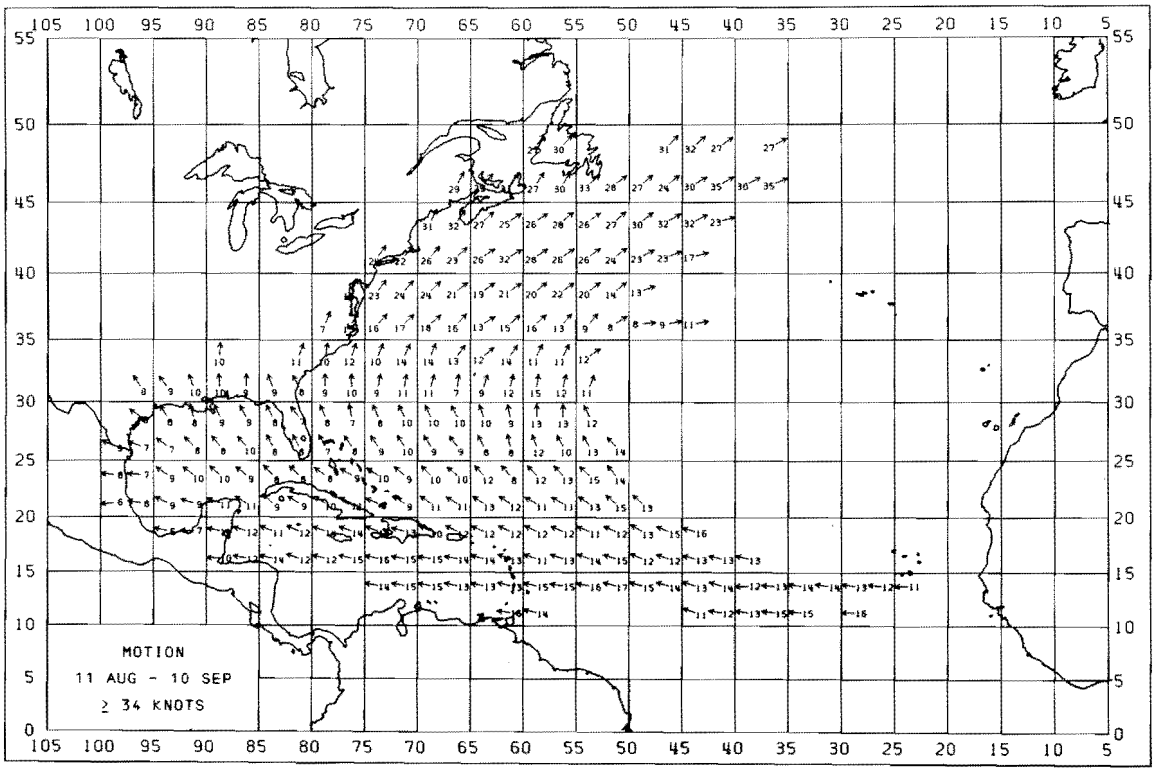
11 AUG - 10 SEP
≥ 34 KNOTS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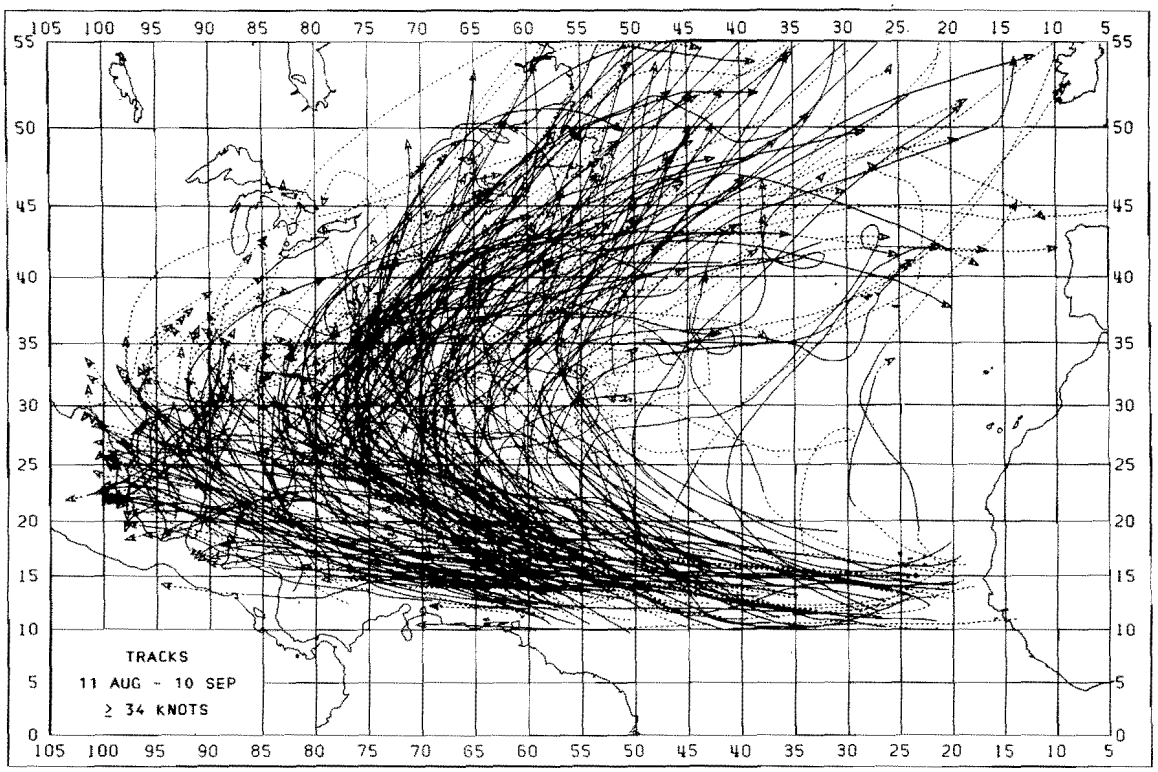

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99	7	278	13	14	3.27
100	7	278	15	15	3.77
101	5	276	15	15	5.27
103	6	273	16	17	2.51
121	8	282	14	15	4.36
122	10	281	15	15	5.65
123	12	281	15	15	5.55
124	15	282	13	13	5.57
125	20	281	13	13	4.05
126	23	284	13	13	4.45
127	19	282	15	15	4.97
128	13	279	15	15	4.53
129	12	281	16	16	4.99
130	14	285	17	17	4.56
131	13	286	15	15	4.95
132	14	286	14	14	4.57
133	13	287	13	13	3.70
134	11	288	14	14	3.26
135	6	268	12	12	4.23
136	6	274	13	13	2.73
137	7	278	14	14	3.85
138	8	279	14	14	4.69
139	7	278	13	13	4.49
140	8	276	12	12	3.86
141	8	270	11	12	4.67
151	6	273	10	11	6.63
152	7	281	12	12	6.37
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154	10	288	12	13	4.46
155	13	284	12	13	4.82
156	15	284	15	15	4.55
157	18	282	16	16	4.46
158	19	279	15	15	4.79
159	20	279	15	15	5.35
160	21	280	14	14	5.45
161	22	285	14	14	4.54
162	21	288	13	13	4.64
163	24	289	11	12	4.04
164	24	289	13	13	5.27
165	20	291	14	14	6.31
166	14	288	15	15	6.07
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168	16	289	12	13	4.66
169	14	285	13	14	3.64
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185	6	282	5	7	3.37
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188	11	286	12	12	3.29
189	15	290	11	12	4.03
190	21	293	12	12	3.65
191	14	289	14	14	4.26
192	13	290	14	14	4.01
193	11	291	14	14	3.10
194	6	285	13	13	2.55
195	13	296	10	11	3.46
196	19	295	12	12	3.33
197	26	294	12	13	3.73
198	25	296	12	13	4.12
199	25	296	12	13	3.76
200	18	292	12	13	3.34
201	14	292	11	12	4.39
202	14	294	12	13	5.00
203	17	301	13	14	5.03
204	10	293	15	15	7.46
205	6	286	16	16	5.20
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221	17	297	9	10	3.61
222	14	286	9	10	3.75
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224	17	302	11	11	3.42
225	20	313	9	11	3.70
226	10	302	9	11	3.77
227	9	301	10	10	2.17
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229	7	291	9	9	4.15
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232	22	301	11	11	5.35
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234	26	304	12	13	4.67
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237	11	302	13	13	5.14
238	11	310	15	16	4.99
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258	14	307	10	11	4.36
259	18	312	10	10	3.84
260	11	308	9	10	2.80
261	13	318	8	10	3.08
262	12	313	8	10	2.91
263	11	305	8	9	2.91
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265	19	302	10	11	3.40
266	20	310	9	10	4.26
267	15	314	10	11	5.31
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272	6	318	13	14	2.43
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293	15	308	7	10	4.75
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296	7	320	10	11	3.40
297	12	335	8	10	3.82
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299	14	333	7	10	4.01
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301	16	326	9	10	3.97
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303	14	329	9	10	4.76
304	15	325	9	10	4.98
305	15	333	8	10	4.36
306	8	349	8	11	3.57
307	9	341	12	15	6.16
308	9	333	10	14	4.33
309	8	330	13	14	7.80
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330	12	346	8	10	4.38
331	12	337	9	12	3.52
332	9	331	9	11	3.17
333	14	333	8	9	3.41
334	14	322	7	9	3.48
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336	24	349	7	10	4.70
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344	7	000	13	17	9.03
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378	6	014	12	13	10.62
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380	9	014	12	16	6.78
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407	7	010	10	11	4.64
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409	18	022	10	13	5.67
410	19	025	14	16	7.54
411	16	021	14	16	7.74
412	14	035	13	14	5.74
413	10	050	12	14	6.89
414	11	034	14	16	7.81
415	10	025	11	13	8.64
416	11	028	11	13	5.44
417	6	056	12	15	6.73
443	6	021	7	13	4.08
444	13	028	13	15	8.62
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446	20	045	17	20	8.62
447	22	049	18	20	8.16
448	20	043	16	17	6.60
449	13	057	13	15	6.60
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451	15	046	16	17	9.35
452	12	041	13	15	7.48
453	9	038	9	13	7.83
454	10	054	8	14	8.37
455	5	085	8	11	7.22
456	5	078	9	12	8.18
457	6	079	11	13	8.20
480	6	024	16	18	6.11
481	11	036	23	24	8.97
482	17	042	24	24	9.91
483	16	046	24	26	10.99
484	20	051	21	25	11.16
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486	14	057	21	23	8.77
487	16	052	20	22	10.35
488	16	055	22	24	9.78
489	15	052	20	21	9.34
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491	5	071	13	18	6.96
517	6	035	24	25	12.83
518	10	036	22	23	11.08
519	15	040	26	27	12.45
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521	17	055	26	27	13.67
522	14	060	32	32	13.28
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524	14	056	26	28	10.37
525	16	054	26	28	9.58
526	17	051	24	27	9.46
527	10	061	23	25	10.12
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557	13	048	27	27	11.02
558	13	057	25	26	9.12
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561	12	054	26	28	8.69
562	15	047	27	29	8.59
563	12	051	30	32	12.13
564	10	060	32	34	9.92
565	8	064	32	33	11.03
566	6	075	23	24	12.21
592	6	028	29	30	14.82
593	7	042	29	29	17.09
594	8	040	31	31	13.35
595	7	031	27	30	9.43
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597	7	049	33	36	6.58
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599	15	050	27	29	9.51
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602	8	060	35	36	9.38
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604	5	067	35	38	12.69
631	9	034	27	29	14.29
632	6	041	30	31	9.40
636	8	043	31	33	10.67
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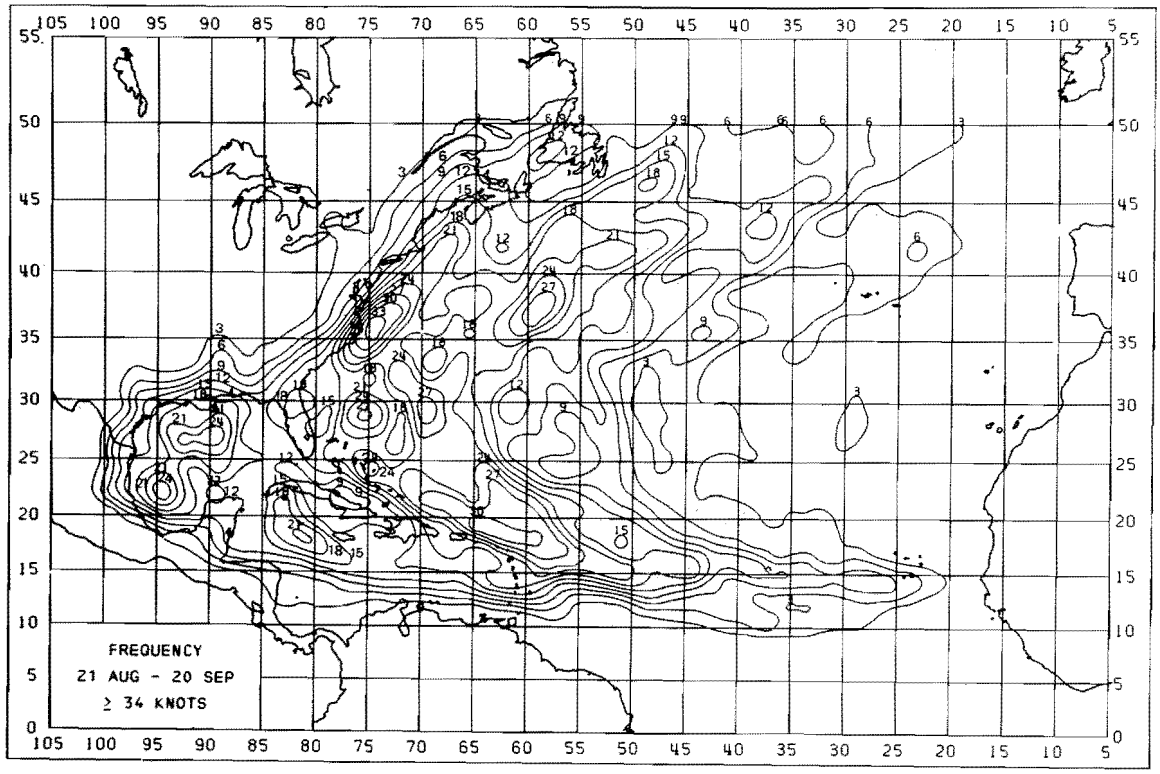
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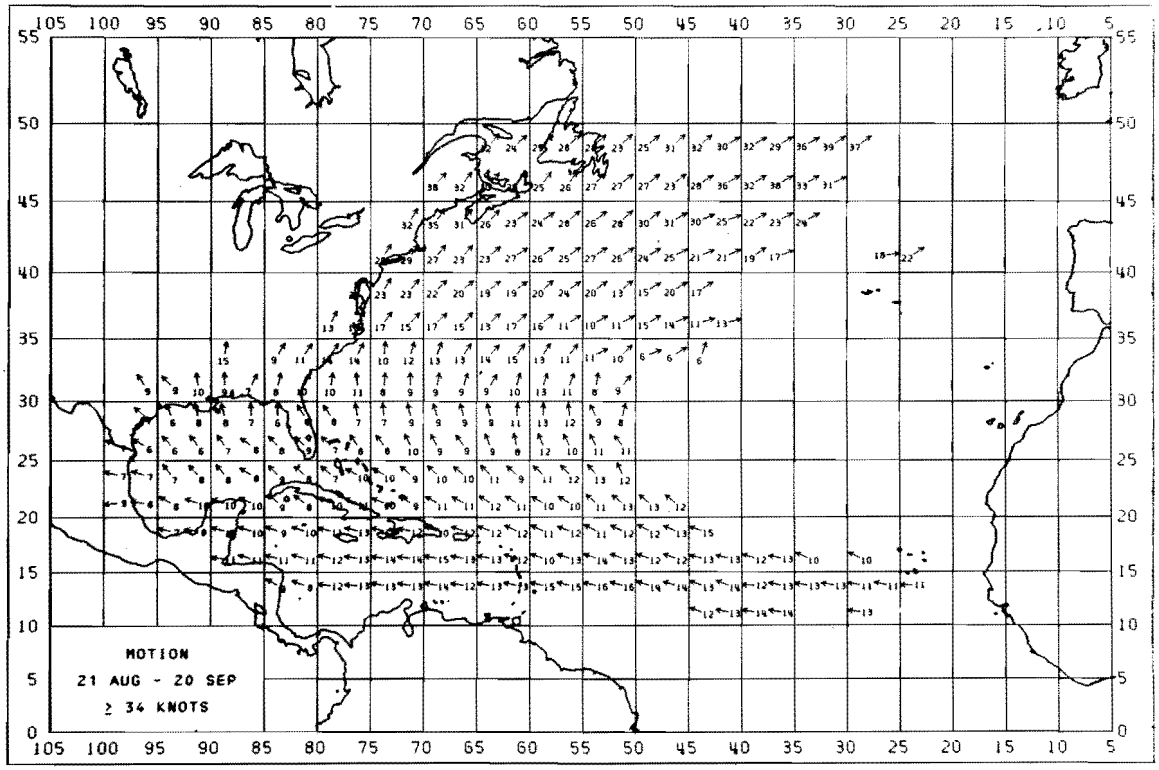
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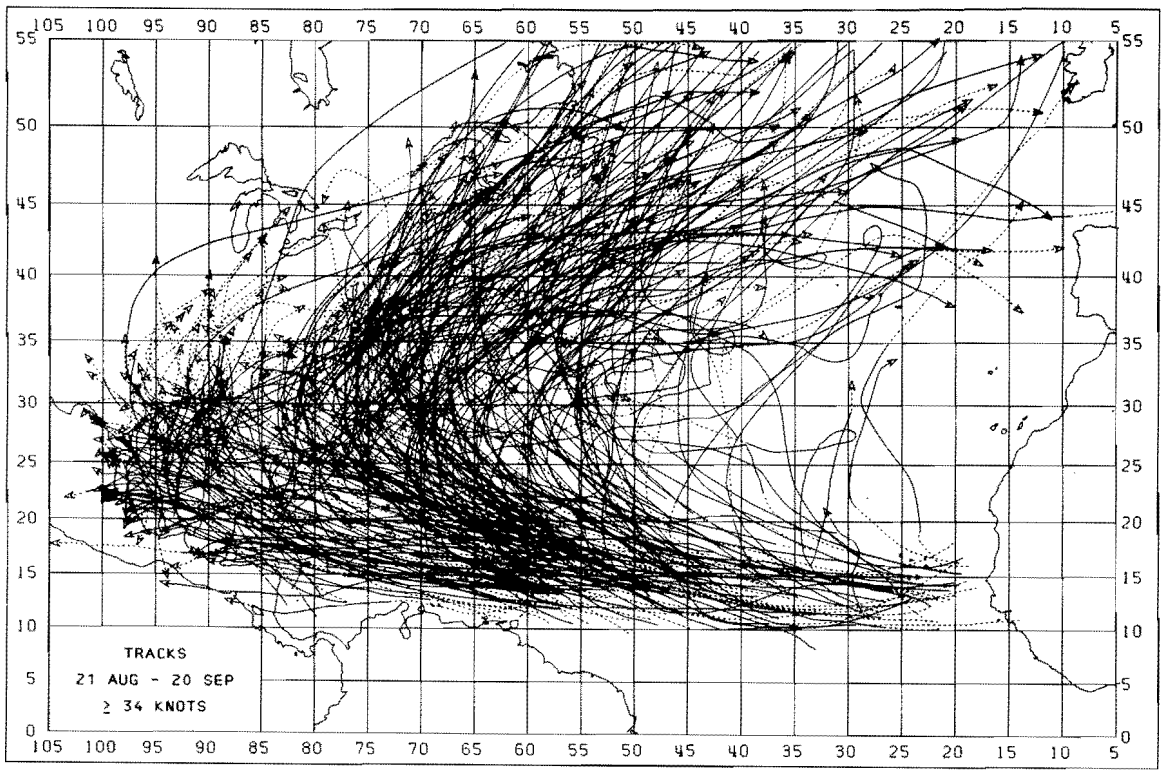

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103	6	277	13	14	4.93
117	5	302	9	10	1.52
118	6	292	8	10	2.83
119	5	277	12	12	4.94
120	7	274	13	13	5.09
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122	10	280	13	13	4.68
123	11	281	14	14	4.38
124	10	279	12	12	5.47
125	17	279	13	13	4.19
126	19	282	13	13	4.96
127	14	283	15	15	5.90
128	10	284	15	15	4.47
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130	15	286	16	17	4.75
131	16	288	14	14	5.11
132	14	287	14	14	4.61
133	12	289	13	13	4.23
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135	7	272	12	12	4.06
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168	19	290	12	12	3.52
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170	13	284	13	13	2.77
171	13	287	12	12	3.30
172	7	281	13	13	3.49
173	9	294	10	13	3.33

A	B	C	D	E	F
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185	7	283	7	8	4.20
186	7	280	8	9	3.83
187	11	288	10	11	3.63
188	14	289	10	11	3.36
189	19	291	9	10	3.15
190	22	288	10	11	3.33
191	13	284	11	11	4.55
192	12	285	13	13	4.07
193	14	283	13	13	3.22
194	13	282	12	12	2.80
195	19	289	10	11	3.18
196	23	289	12	12	3.19
197	33	293	12	13	3.47
198	31	295	12	13	3.76
199	31	296	11	12	3.80
200	22	291	12	13	3.25
201	16	298	11	12	3.28
202	14	295	12	12	3.80
203	16	300	12	13	4.18
204	10	294	13	13	6.78
205	6	290	15	15	5.39
219	9	267	9	10	5.52
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221	23	302	8	9	3.90
222	15	291	10	10	3.45
223	12	290	10	12	2.68
224	13	298	10	10	2.91
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226	13	308	8	10	3.65
227	9	295	10	11	2.35
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229	12	293	10	11	3.51
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239	9	311	13	13	3.78
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261	13	315	9	10	3.16
262	12	311	8	9	2.75
263	15	312	7	9	3.03

A	B	C	D	E	F
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265	23	302	10	11	3.82
266	25	311	9	10	3.84
267	23	314	10	11	4.46
268	22	309	10	11	4.55
269	26	315	11	12	4.25
270	19	312	9	10	3.33
271	12	313	11	11	5.21
272	8	318	12	12	3.48
273	10	322	13	15	5.90
274	9	337	12	15	5.86
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293	20	320	6	9	3.34
294	24	325	6	9	3.46
295	22	327	7	10	3.55
296	14	308	8	10	3.78
297	14	318	8	11	3.54
298	16	316	9	11	2.13
299	18	316	7	10	2.74
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301	19	325	8	10	2.57
302	20	336	10	11	3.92
303	22	332	9	10	3.92
304	23	326	9	10	4.33
305	19	337	9	10	4.57
306	10	348	8	12	3.67
307	11	340	12	14	5.55
308	10	334	10	13	4.60
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310	9	323	11	13	4.22
328	11	313	7	9	4.81
329	17	341	6	9	4.30
330	19	349	8	11	4.51
331	23	346	8	12	4.33
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333	18	358	6	10	5.21
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336	27	350	7	10	5.11
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339	28	345	9	12	4.29
340	22	346	9	11	4.88
341	17	348	9	12	4.13
342	11	004	11	14	5.36
343	12	002	13	16	7.79
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346	7	013	8	11	4.54
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365	7	317	9	11	3.42
366	12	354	10	13	4.36

A	B	C	D	E	F
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368	9	025	7	12	7.28
369	14	013	8	14	7.84
370	16	024	10	14	7.32
371	16	008	10	12	5.35
372	19	354	11	13	4.03
373	19	006	8	11	4.97
374	26	000	9	12	5.27
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376	23	017	9	12	5.93
377	15	031	9	12	4.10
378	13	015	10	14	8.13
379	11	017	13	15	7.98
380	12	018	11	15	6.62
381	12	010	8	12	5.43
382	7	039	9	12	8.33
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405	5	032	9	10	7.67
406	13	035	11	14	8.68
407	18	033	14	17	7.25
408	29	027	14	16	6.66
409	23	007	10	13	4.91
410	21	016	12	14	6.54
411	17	019	13	14	7.25
412	22	035	13	15	6.75
413	20	044	14	17	7.37
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415	14	033	13	14	8.16
416	18	039	11	14	5.61
417	11	063	11	13	5.73
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419	6	069	6	10	4.47
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445	34	036	17	19	6.98
446	22	043	15	18	7.52
447	23	047	17	19	7.21
448	23	042	15	17	6.39
449	20	048	13	16	7.19
450	26	049	17	18	9.41
451	26	051	16	18	9.13
452	18	057	11	15	6.47
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454	18	062	11	16	8.27
455	13	059	15	18	8.77
456	8	066	14	17	9.50
457	10	072	11	13	6.32
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481	19	031	23	25	8.33
482	26	039	23	24	8.42

A	B	C	D	E	F
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484	23	048	20	22	10.61
485	21	051	19	21	9.89
486	19	054	19	21	9.71
487	25	048	20	22	10.25
488	22	054	24	25	10.09
489	16	053	20	21	10.48
490	15	049	13	16	8.53
491	10	061	15	18	7.00
492	9	058	20	21	9.35
493	9	056	17	18	11.03
517	9	033	29	30	11.15
518	16	035	29	29	10.83
519	22	040	27	28	11.29
520	18	043	23	25	8.48
521	16	051	23	25	9.70
522	15	058	27	28	11.59
523	20	053	26	28	10.83
524	21	054	25	27	9.87
525	23	056	27	29	10.73
526	22	057	26	28	10.54
527	18	060	24	26	9.15
528	10	065	25	26	7.53
529	8	067	21	22	10.09
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537	6	056	22	26	11.98
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565	13	068	30	31	10.93
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567	12	061	22	24	9.64
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597	11	046	27	29	8.83
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A	B	C	D	E	F
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603	8	058	32	33	13.73
604	8	060	38	39	12.00
605	10	059	33	34	8.09
606	8	066	31	33	4.92
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630	8	051	24	26	16.46
631	12	050	25	27	12.58
632	12	051	28	30	8.53
633	9	049	28	30	8.08
634	10	067	23	26	5.39
635	9	052	25	27	7.01
636	12	047	31	33	11.01
637	10	049	32	34	8.55
638	8	062	30	32	8.06
639	7	062	32	33	6.90
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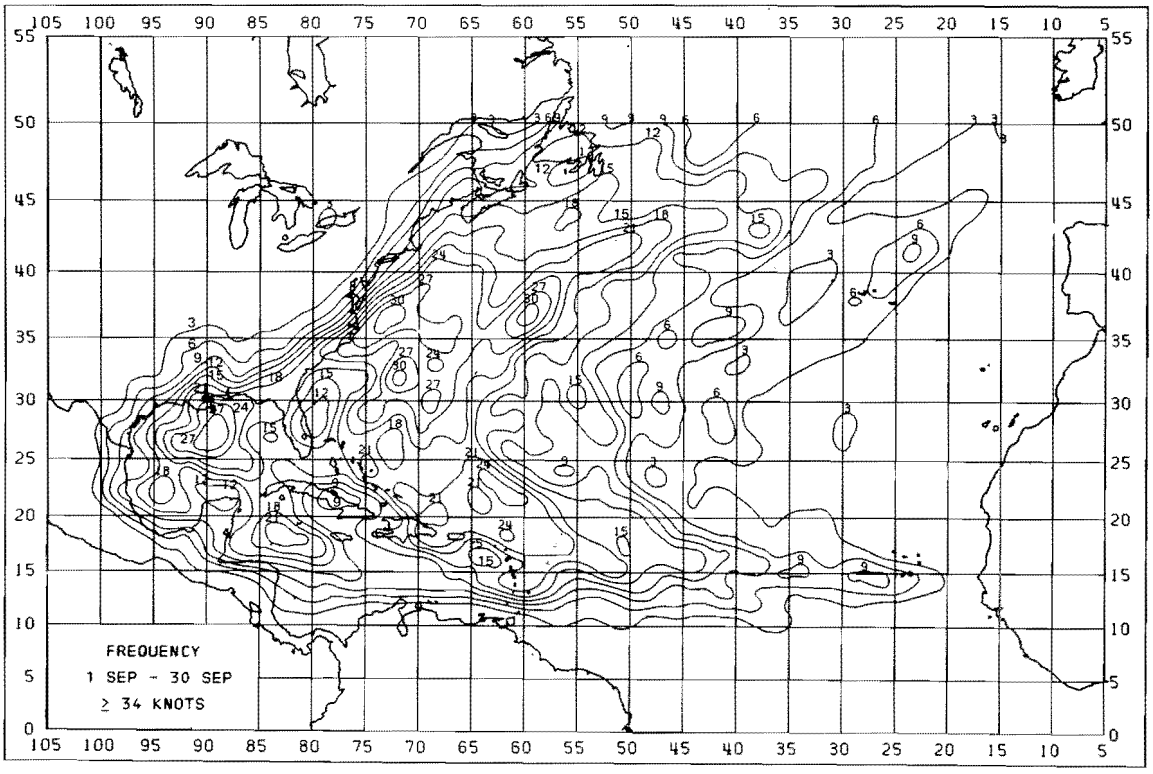
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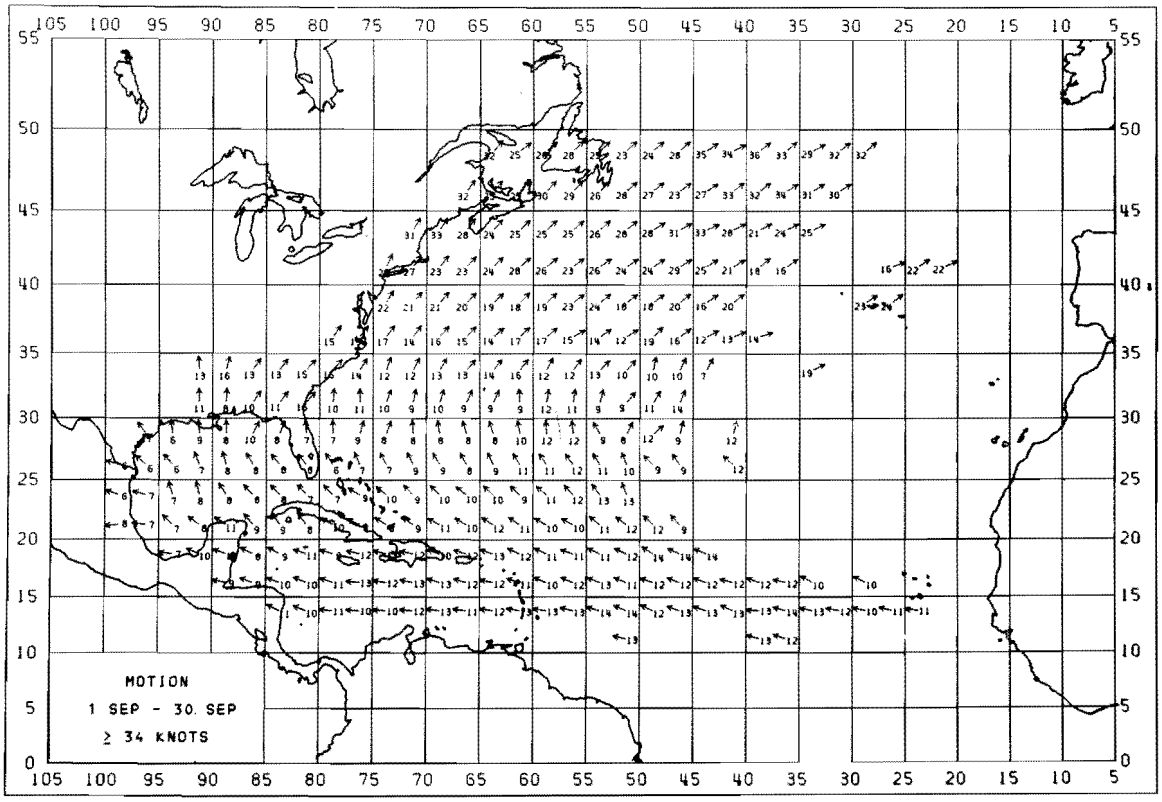
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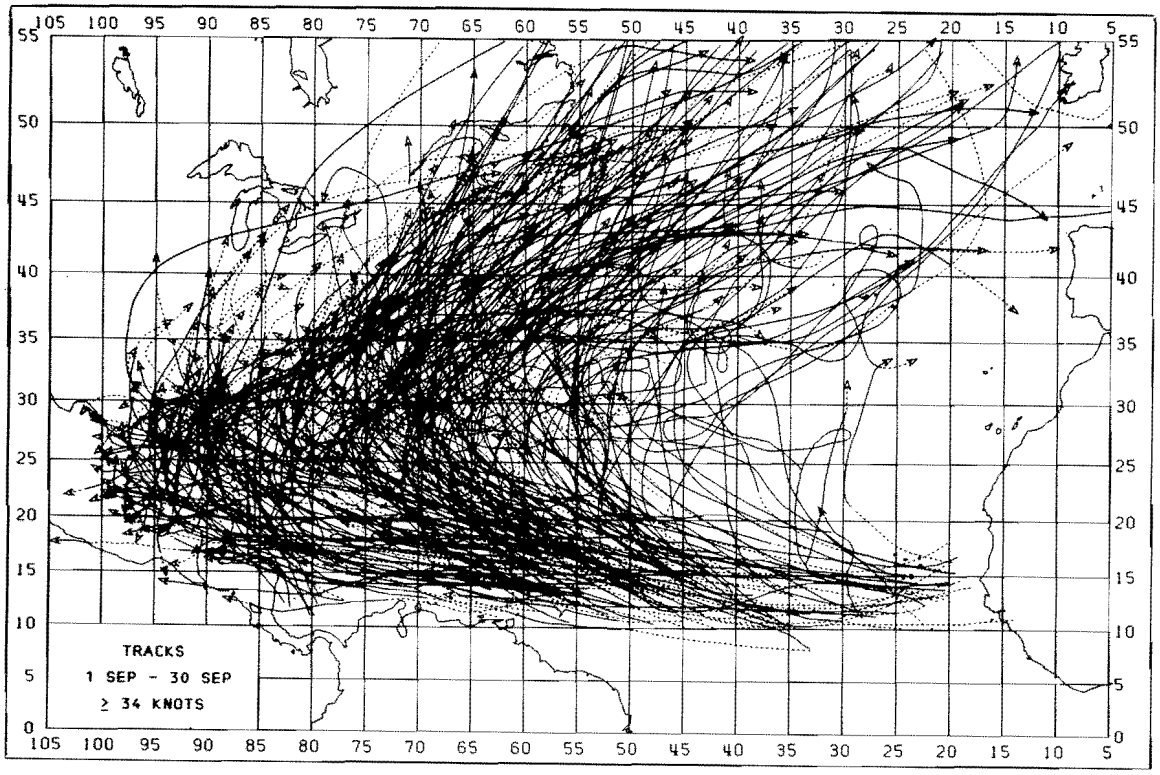

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119	8	277	11	11	4.06
120	11	274	10	10	3.16
121	11	275	10	10	3.39
122	11	275	12	12	3.59
123	12	278	13	14	3.77
124	10	278	11	12	2.71
125	17	279	12	12	2.81
126	19	280	13	13	4.18
127	17	279	13	15	3.75
128	12	283	13	14	4.04
129	10	286	14	14	4.65
130	13	293	14	14	5.44
131	14	295	12	13	3.85
132	8	289	13	13	4.50
133	9	288	13	13	4.70
134	10	295	13	13	4.41
135	5	273	13	13	4.19
136	6	284	14	14	2.14
137	6	281	13	13	3.07
138	7	280	12	13	4.36
139	8	281	10	11	4.28
140	8	283	11	12	3.51
141	7	276	11	11	4.77
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152	15	290	9	10	3.46
153	15	291	10	11	3.50
154	16	292	10	11	4.54
155	17	288	11	12	4.99
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157	9	278	12	12	3.80
158	11	281	13	13	3.50
159	12	287	13	13	4.33
160	16	287	12	12	3.64
161	14	282	12	13	3.07
162	17	287	11	11	2.80
163	20	292	10	11	2.99
164	20	292	12	13	6.11
165	20	292	13	13	6.11
166	18	292	11	12	5.14
167	16	289	12	13	4.13
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169	17	288	12	13	3.67
170	12	284	12	13	3.19
171	11	289	12	12	2.80
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175	6	294	10	11	4.33
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187	12	289	11	12	4.56
188	16	296	8	9	4.04
189	25	298	9	10	3.90
190	19	289	11	12	4.12
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192	12	283	12	12	3.10
193	17	284	11	11	3.08
194	17	282	12	12	2.65
195	24	288	10	11	2.68
196	22	287	12	13	3.34
197	24	289	13	13	3.25
198	25	294	12	12	3.51
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200	21	289	11	11	2.86
201	16	296	11	12	3.54
202	14	295	12	13	4.13
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232	24	299	10	11	4.52
233	19	302	12	13	4.15
234	25	303	11	11	3.82
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236	16	298	10	12	3.81
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238	13	306	12	14	5.04
239	12	312	12	13	4.08
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255	9	288	6	8	3.93
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261	15	317	8	9	3.17
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263	16	315	7	9	3.56
264	16	299	9	10	3.96
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266	19	316	9	11	3.48
267	19	314	10	11	4.12
268	21	308	10	11	3.93
269	25	313	10	11	4.07
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271	11	310	11	12	4.72
272	8	316	12	12	3.35
273	12	324	13	15	6.01
274	8	340	13	15	5.73
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292	14	310	6	9	2.62
293	22	318	6	8	3.04
294	28	338	7	10	3.28
295	27	344	8	11	3.61
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297	17	320	8	10	3.25
298	15	321	8	11	2.41
299	15	327	6	11	3.02
300	21	336	7	10	4.39
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302	19	334	9	11	3.90
303	21	329	9	10	3.89
304	21	330	8	9	3.80
305	17	335	9	10	4.23
306	11	328	11	13	4.25
307	14	327	11	13	5.66
308	13	324	12	14	4.82
309	10	329	11	14	7.05
310	11	339	10	13	5.96
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314	6	331	12	16	4.18
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369	17	038	11	15	8.32
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372	17	000	11	13	4.88
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404	6	035	13	14	8.88
405	7	037	13	14	8.42
406	14	043	15	18	9.57
407	23	041	16	19	9.41
408	26	033	14	17	8.58
409	23	018	12	15	8.28
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411	26	030	13	15	7.05
412	26	040	13	16	7.09
413	24	040	14	17	6.85
414	21	037	16	18	6.74
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416	16	035	12	15	5.78
417	11	046	13	15	6.32
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419	7	011	10	15	11.38
420	7	026	10	13	8.29
421	9	028	7	9	5.18
425	6	063	19	21	9.61
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444	18	038	15	18	8.25
445	32	036	17	20	8.33
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447	27	041	16	19	7.56
448	31	043	15	17	7.76
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450	28	045	17	19	8.89
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452	19	060	15	19	8.95
453	18	056	14	18	9.14
454	16	058	12	18	7.98
455	12	044	19	23	10.50
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458	11	069	13	14	6.28
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483	27	042	21	23	10.22
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487	25	048	19	20	10.11
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517	7	025	29	31	13.17
518	14	035	27	28	12.73
519	20	039	23	24	10.25
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521	21	046	24	26	10.53
522	19	051	28	30	10.84
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524	20	054	23	24	9.98
525	23	056	26	27	11.93
526	23	057	24	26	12.33
527	18	058	24	26	11.26
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529	8	058	25	26	16.23
530	7	059	21	22	11.85
531	10	050	18	21	8.46
532	5	057	16	20	12.12
536	7	072	16	19	12.27
537	9	058	22	25	10.70
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606	8	058	30	32	6.68
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633	12	047	25	27	8.25
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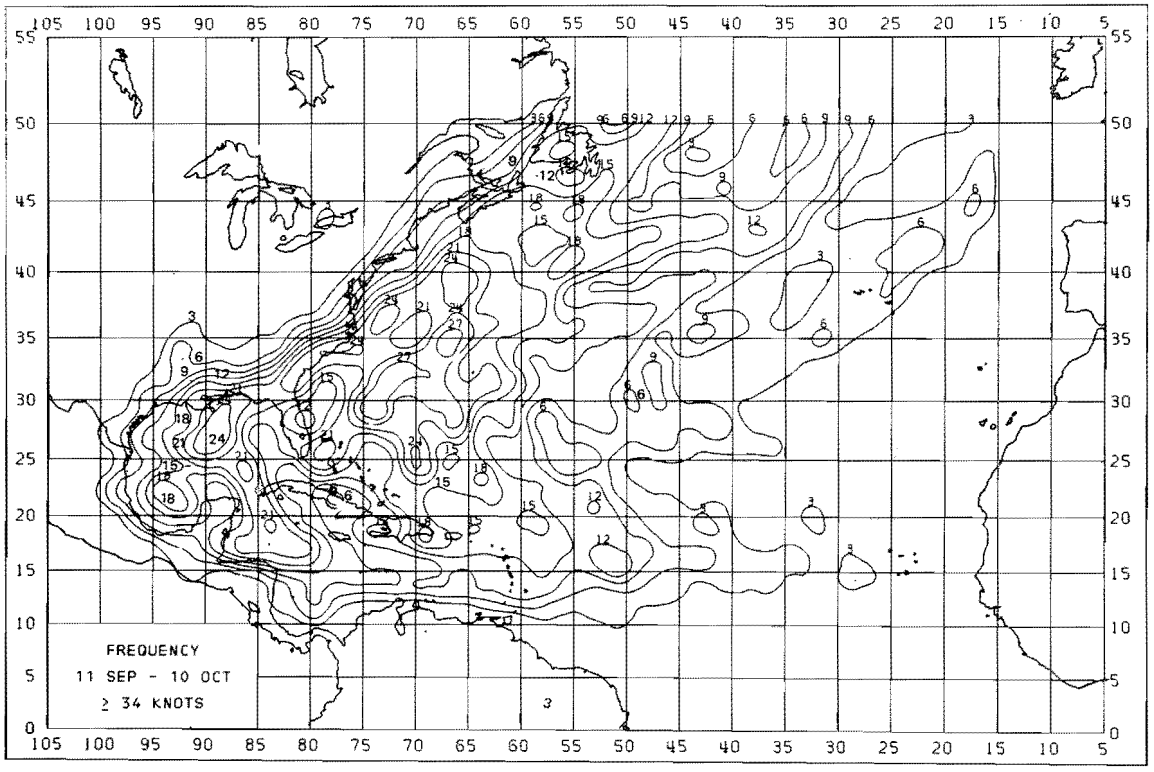
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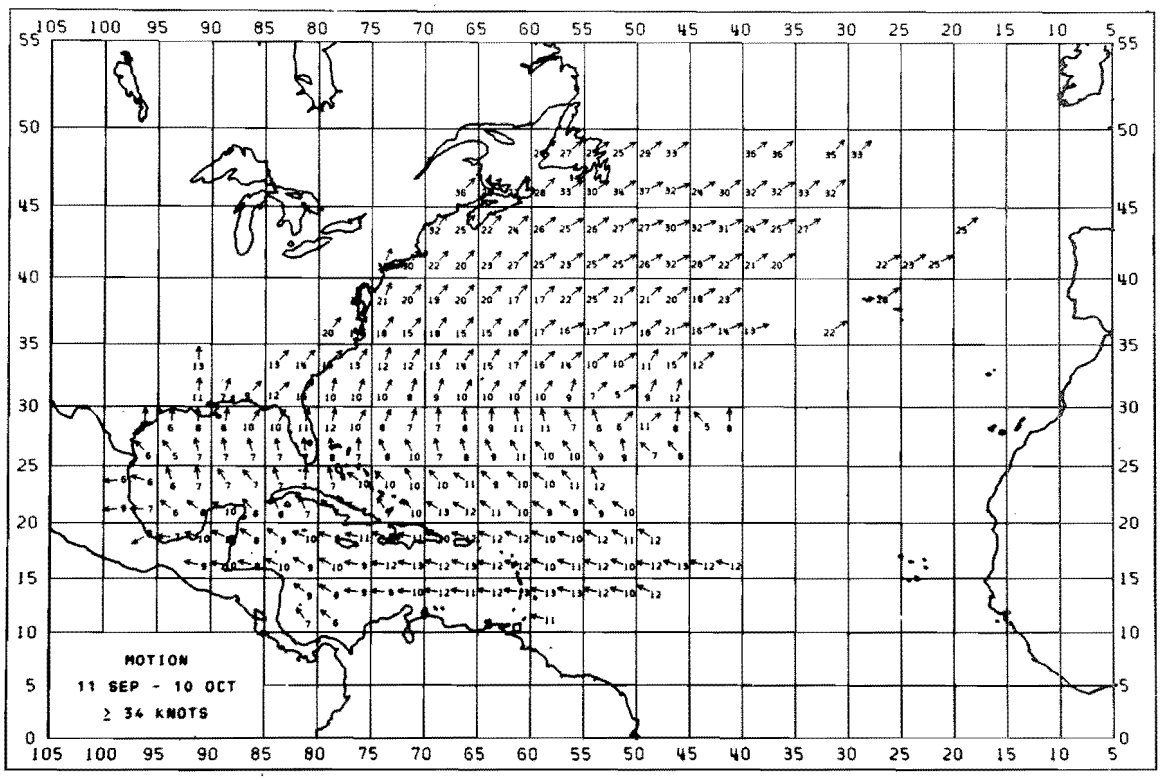
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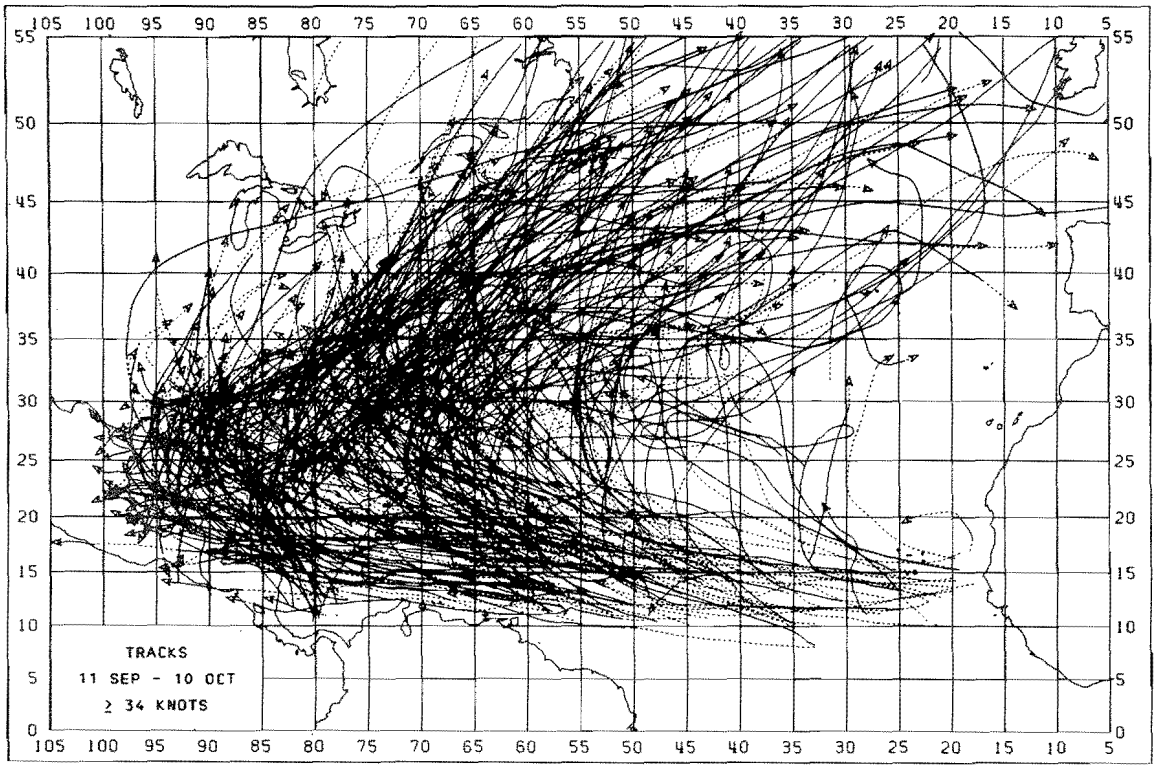

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120	9	278	9	9	2.27
121	8	275	9	9	3.48
122	8	275	10	10	2.60
123	10	279	12	12	2.23
124	9	279	11	12	1.53
125	11	279	12	12	3.14
126	9	279	13	13	4.22
127	10	283	13	15	4.50
128	9	286	13	14	4.42
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130	8	285	10	11	3.96
131	7	297	12	12	4.02
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151	10	279	10	10	2.65
152	16	286	9	10	3.25
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154	18	301	9	10	4.16
155	13	297	10	12	5.05
156	11	282	9	11	5.73
157	6	279	12	12	4.33
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159	10	288	12	13	4.08
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161	11	282	12	13	3.55
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189	23	307	9	10	4.01
190	16	293	10	11	4.52
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192	8	284	11	12	3.70
193	14	287	9	11	3.20
194	13	282	11	12	2.91
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197	16	290	12	13	2.75
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A	B	C	D	E	F
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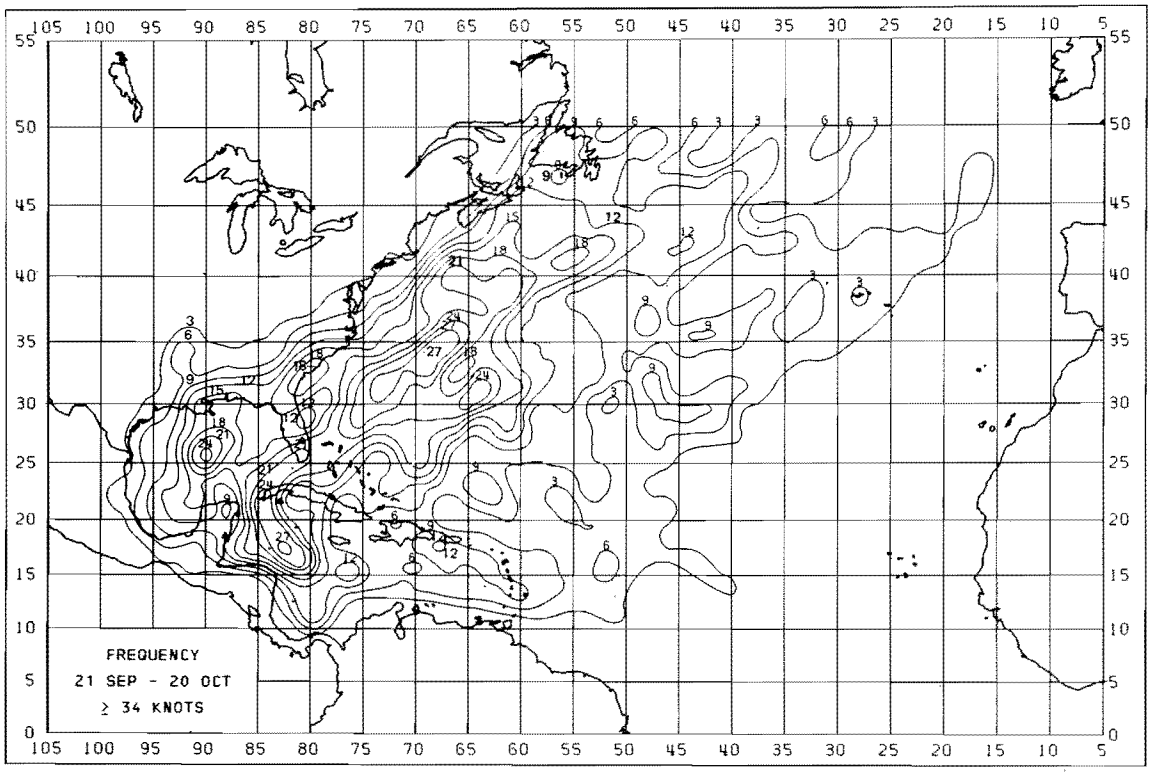
200	13	289	10	11	3.05
201	9	298	12	13	2.92
202	9	300	11	12	4.85
203	6	304	12	15	6.25
219	7	266	9	10	4.91
220	11	272	7	8	4.72
221	18	309	6	8	3.21
222	16	307	8	9	2.88
223	10	297	10	11	1.87
224	18	318	8	9	3.49
225	19	332	8	10	2.98
226	13	335	7	9	2.75
227	7	311	7	9	4.32
228	7	296	7	8	2.69
229	10	325	7	11	3.17
230	18	315	10	12	3.43
231	15	302	13	14	4.27
232	14	298	12	13	3.52
233	15	306	11	12	3.14
234	13	306	10	11	2.87
235	15	303	9	10	4.23
236	11	307	9	11	3.51
237	12	319	9	12	4.89
238	7	303	10	11	4.49
255	6	265	6	7	3.24
256	10	288	6	9	2.98
257	16	342	6	9	3.09
258	15	352	7	10	4.22
259	15	330	7	9	3.58
260	22	321	7	9	2.96
261	13	341	7	9	3.72
262	11	004	7	10	3.34
263	16	347	7	11	4.12
264	13	306	10	11	4.43
265	14	312	10	12	4.22
266	18	333	10	13	4.61
267	21	318	10	12	4.75
268	16	303	11	12	3.47
269	19	313	9	10	3.73
270	12	308	10	11	3.37
271	11	305	10	10	3.94
272	6	319	11	11	3.28
273	7	339	12	14	5.84
292	12	319	6	9	2.64
293	16	322	5	8	2.73
294	24	347	7	9	3.42
295	24	352	7	10	3.95
296	17	346	7	10	4.84
297	15	349	7	12	4.19
298	17	353	7	12	4.16
299	21	353	8	13	5.19
300	17	359	7	11	5.15

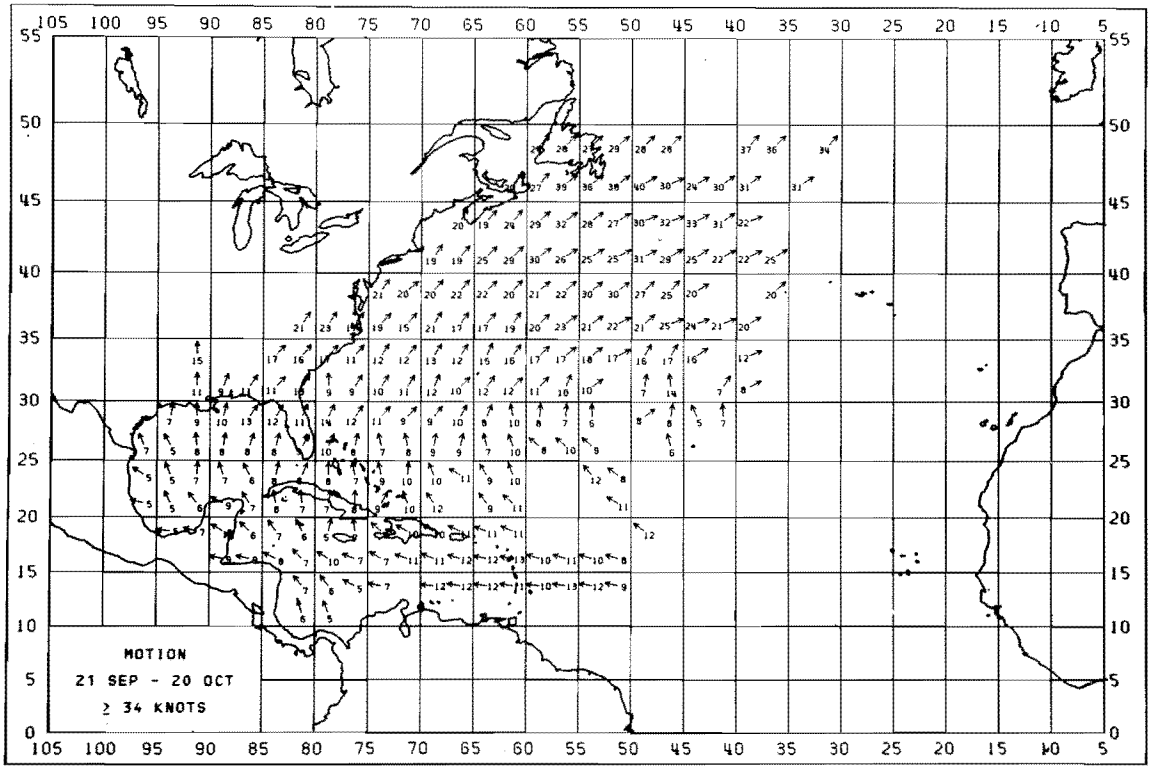
A	B	C	D	E	F
301	15	335	8	10	2.70
302	20	333	10	11	3.46
303	21	346	7	11	4.45
304	17	345	8	10	4.23
305	14	335	9	11	4.00
306	10	327	11	13	4.22
307	9	318	10	11	3.06
308	6	323	10	13	5.11
309	6	325	9	12	4.27
310	8	352	9	12	6.07
311	6	313	7	10	6.03
312	7	321	8	14	6.92
328	6	004	7	9	5.23
329	11	003	6	8	4.96
330	19	359	8	10	4.33
331	26	010	8	11	4.37
332	20	030	10	13	7.33
333	18	028	10	14	7.43
334	10	015	11	15	5.67
335	15	014	12	16	6.46
336	23	029	10	13	5.62
337	29	022	8	12	5.64
338	21	015	7	10	3.09
339	23	000	7	10	4.19
340	26	356	8	11	4.56
341	15	001	9	15	6.37
342	17	351	11	14	6.35
343	6	348	11	13	6.48
344	8	334	7	12	3.94
345	10	341	6	10	2.48
346	9	038	6	11	4.62
347	6	048	11	14	6.53
348	8	006	8	14	8.93
349	7	318	5	11	4.41
350	8	359	8	14	5.50
366	14	005	11	13	3.98
367	16	018	7	11	4.08
368	18	041	9	12	7.37
369	18	049	12	16	7.84
370	23	035	15	19	8.65
371	13	013	10	14	5.96
372	20	020	10	14	7.17
373	27	027	10	14	7.41
374	27	015	8	14	6.09
375	26	017	9	13	5.76
376	22	028	10	13	6.66
377	23	034	10	15	5.20
378	20	033	10	16	6.50
379	13	035	10	15	5.68
380	10	016	9	14	5.28
381	11	042	7	14	8.48
382	9	060	5	12	8.93
383	9	023	9	14	7.64

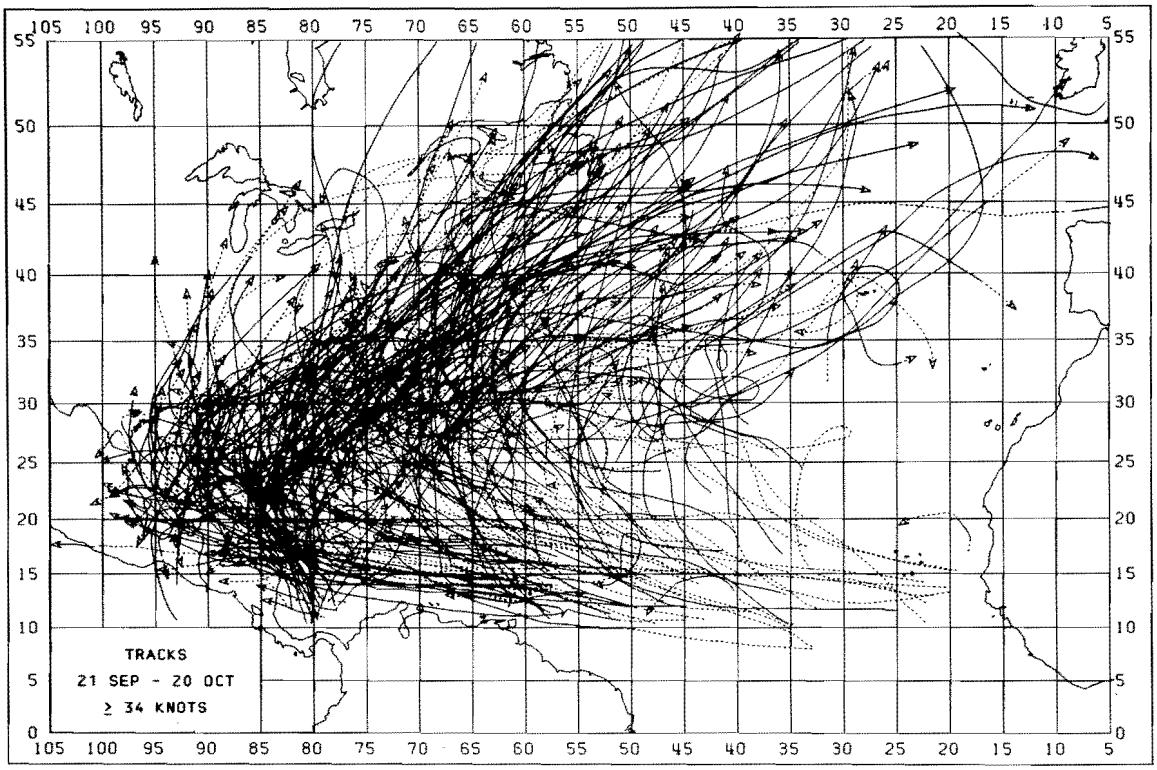
A	B	C	D	E	F
384	8	016	12	17	9.17
402	6	001	13	14	5.50
405	6	044	13	14	8.57
406	18	042	14	17	9.21
407	25	044	16	19	9.81
408	25	037	13	17	8.74
409	22	020	12	16	8.50
410	24	033	12	15	7.53
411	25	035	13	14	5.36
412	25	036	14	16	6.63
413	20	035	15	18	6.73
414	16	042	17	18	5.25
415	11	048	16	19	5.54
416	14	051	14	16	6.53
417	10	054	10	12	6.52
418	10	058	10	14	8.64
419	9	034	11	17	11.64
420	6	050	15	18	9.18
421	7	050	12	14	8.60
443	6	038	20	20	8.26
444	15	036	17	19	8.36
445	26	034	18	20	7.77
446	19	040	15	17	8.03
447	20	035	18	20	7.41
448	27	036	15	18	7.53
449	23	044	15	18	8.11
450	19	047	18	19	8.07
451	21	052	17	20	8.13
452	14	069	16	20	8.68
453	16	062	17	20	8.58
454	15	064	17	20	8.52
455	14	051	18	22	11.13
456	7	068	21	24	10.43
457	10	070	16	18	9.42
458	8	069	14	16	6.39
459	6	071	13	15	5.73
462	5	056	22	23	11.42
480	6	023	20	22	8.26
481	15	024	21	24	10.17
482	21	040	20	21	7.94
483	24	042	19	21	8.57
484	25	040	20	22	10.83
485	23	045	20	23	11.08
486	18	040	17	19	8.84
487	17	048	17	19	9.74
488	13	051	22	23	9.89
489	8	053	25	27	11.50
490	8	052	21	22	11.08
491	8	051	21	23	9.86
492	10	051	20	22	12.44
493	10	059	18	18	11.14
494	6	054	23	24	9.66
500	7	054	28	30	10.13

A	B	C	D	E	F
517	6	025	32	34	11.47
518	10	036	30	31	11.98
519	15	043	22	23	9.32
520	23	040	20	23	9.43
521	20	045	23	26	11.46
522	18	043	27	29	11.71
523	14	057	25	26	12.55
524	18	056	23	24	10.17
525	17	060	25	26	12.32
526	16	062	25	26	12.68
527	13	061	26	28	10.37
528	9	064	32	33	9.51
529	8	064	28	29	15.48
530	8	057	22	22	10.67
531	9	056	21	22	8.97
532	6	055	20	22	12.19
536	7	061	22	26	11.29
537	8	058	23	28	9.31
538	7	064	25	28	10.84
555	10	036	32	33	18.37
556	13	042	25	27	14.04
557	18	044	22	23	6.54
558	17	046	24	25	9.99
559	17	054	26	28	12.33
560	17	060	25	27	12.45
561	15	054	26	28	9.99
562	11	061	27	30	12.12
563	11	069	27	29	10.71
564	13	071	30	32	11.24
565	12	071	32	34	11.55
566	13	064	31	33	12.97
567	11	064	24	27	11.89
568	11	062	25	27	11.52
569	9	059	27	29	10.58
575	5	051	25	28	11.67
592	7	044	36	39	12.84
593	8	045	28	29	13.55
594	12	047	22	23	7.29
595	14	044	28	29	9.53
596	12	058	33	35	20.13
597	13	058	30	33	22.24
598	15	057	34	37	19.16
599	10	064	37	41	21.81
600	9	071	32	34	25.38
601	8	060	24	26	8.39
602	9	051	30	32	12.39
603	7	054	32	34	13.86
604	6	061	32	33	15.70
605	12	051	33	34	11.53
606	9	046	32	35	9.73
631	10	051	24	25	8.65
632	15	052	27	29	8.03
633	13	057	25	27	7.67

A	B	C	D	E	F
634	13	057	25	27	7.41
635	14	054	29	31	10.12
636	11	055	33	34	13.31
639	7	053	36	38	8.64
640	6	049	36	38	8.22
642	10	041	35	38	17.81
643	8	044	33	35	14.19


FREQUENCY
21 SEP - 20 OCT
≥ 34 KNOTS


MOTION
21 SEP - 20 OCT
≥ 34 KNOTS



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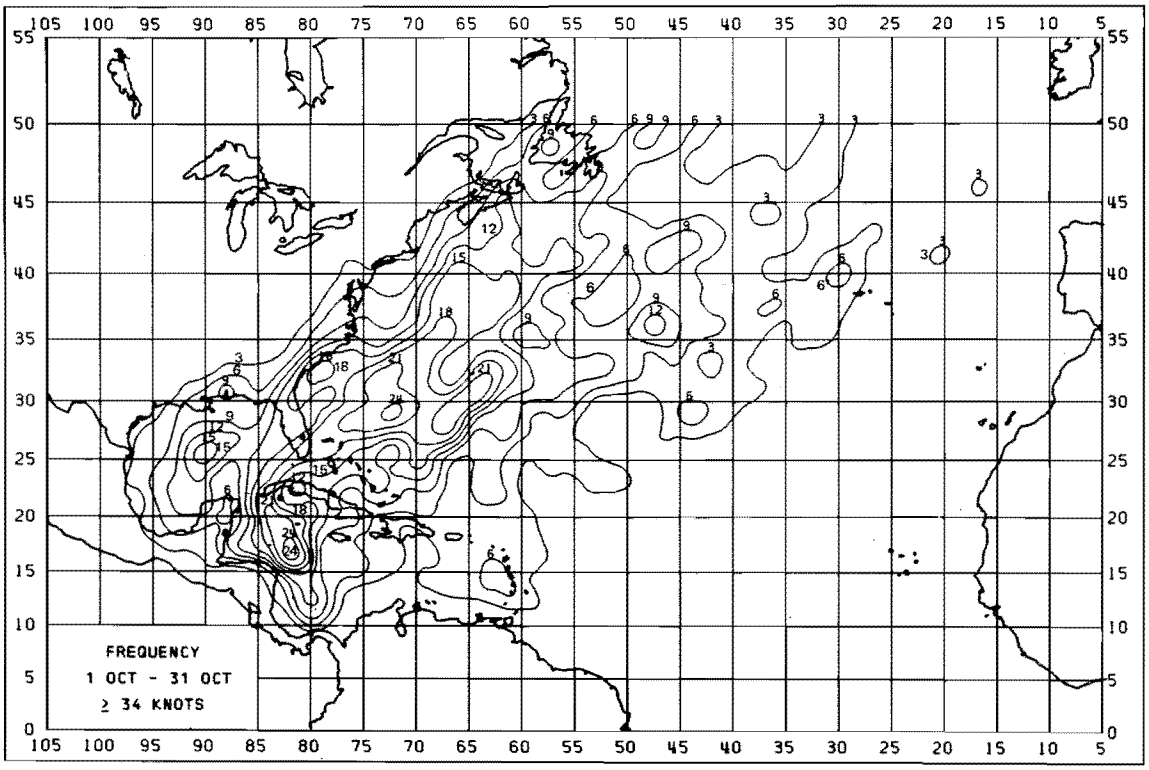
83	10	339	5	6	4.41
118	11	321	7	8	4.58
119	9	324	6	9	3.62
120	8	299	5	8	2.28
121	6	281	7	9	3.66
123	7	276	12	12	2.24
124	8	280	12	12	1.74
125	9	278	12	12	3.39
126	9	278	11	12	4.31
127	8	276	10	13	4.82
128	7	279	13	13	4.87
129	7	279	12	12	3.81
130	5	282	9	10	4.04
151	7	281	9	10	2.20
152	12	283	9	9	3.61
153	17	297	8	9	4.74
154	27	316	7	9	3.83
155	13	302	10	11	3.94
156	12	291	7	10	5.17
157	6	302	7	11	2.94
158	6	289	11	13	3.52
159	8	292	11	12	3.49
160	9	286	12	13	2.39
161	10	281	12	13	3.78
162	8	279	13	13	3.78
163	8	288	10	10	3.25
164	5	288	11	12	4.47
165	5	287	10	11	4.16
166	7	287	8	9	4.21
185	9	276	5	10	3.60
186	8	285	7	8	5.45
187	9	301	10	11	4.56
188	15	315	6	9	4.46
189	25	326	7	10	4.58
190	18	333	6	9	4.68
191	12	014	5	10	4.02
192	7	354	7	12	6.24
193	9	312	7	9	3.07
194	8	298	10	12	2.72
195	10	301	10	11	2.42
196	7	295	11	13	2.71
197	7	292	11	12	4.28
198	6	293	11	12	2.26
203	5	308	12	15	6.96
220	6	283	5	7	3.55
221	11	336	5	9	2.47
222	15	323	6	9	2.81
223	11	297	9	10	2.87
224	18	327	7	9	4.26
225	25	349	8	9	3.66
226	14	353	7	9	3.40
227	12	011	7	10	4.10

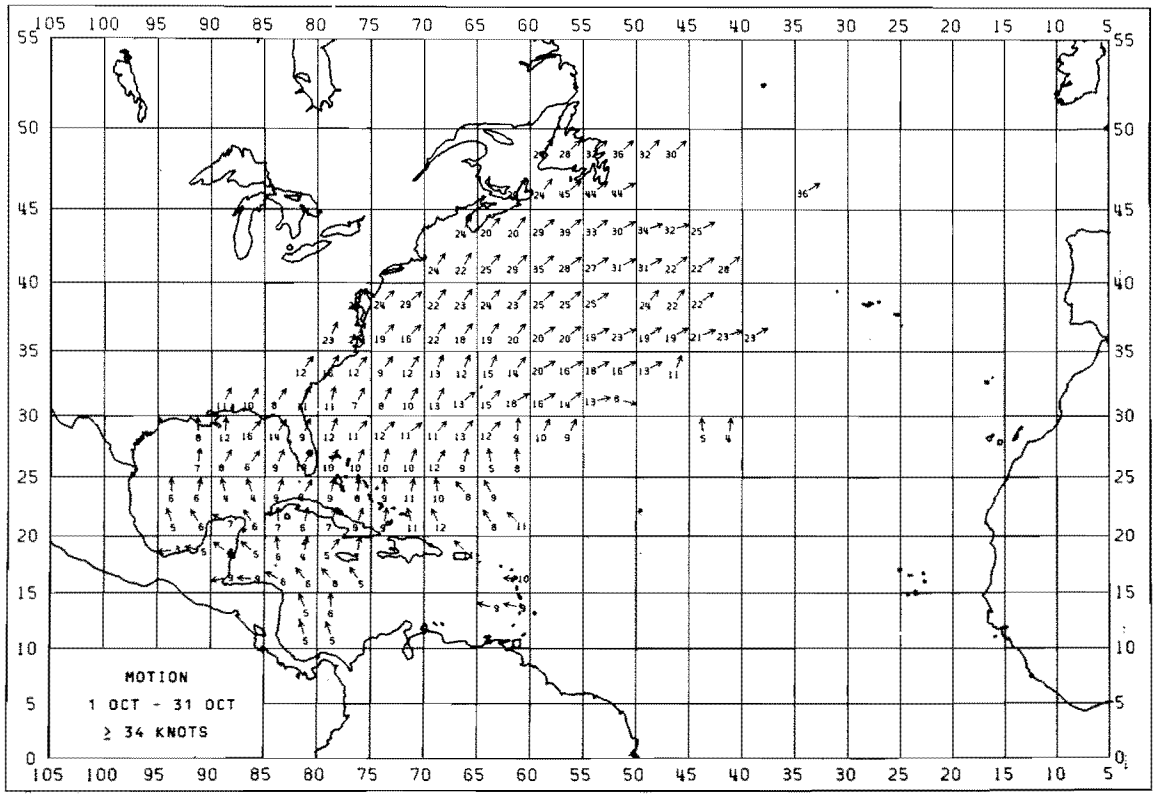
A	B	C	D	E	F
228	7	001	8	12	7.08
229	9	028	9	12	6.28
230	9	341	10	12	3.80
231	8	326	12	14	3.93
233	8	324	9	11	2.42
234	7	312	11	12	3.06
238	5	301	11	12	4.15
256	5	302	5	9	3.35
257	10	338	5	10	2.88
258	16	003	7	9	3.03
259	14	341	7	9	3.88
260	18	333	6	9	3.43
261	22	012	8	10	3.46
262	18	022	8	11	3.53
263	18	359	8	11	4.72
264	12	348	7	11	4.76
265	11	348	9	13	6.00
266	14	004	10	13	6.07
267	15	337	10	13	4.86
268	8	301	11	11	3.74
269	11	328	9	11	3.17
270	5	340	10	13	2.30
273	7	321	12	14	4.84
274	5	306	8	11	5.56
292	6	338	7	11	3.28
293	8	333	5	9	4.75
294	20	354	8	11	4.84
295	21	009	8	12	4.47
296	13	017	8	11	4.82
297	16	014	8	11	4.67
298	21	030	9	13	4.72
299	21	023	10	15	6.44
300	18	012	8	12	6.69
301	13	347	7	13	7.99
302	17	349	8	12	6.19
303	19	008	9	13	6.17
304	9	011	9	13	5.72
305	8	346	7	10	2.80
306	9	339	10	13	3.79
307	8	309	8	10	3.57
308	8	311	10	13	4.49
309	7	311	9	12	3.62
312	5	346	6	11	8.71
329	6	010	7	10	4.44
330	15	358	9	11	4.73
331	16	014	10	12	5.29
332	13	033	13	15	7.00
333	15	030	12	14	7.21
334	11	022	11	15	5.51
335	16	024	16	16	6.28
336	26	035	12	14	6.69
337	23	041	11	14	8.20
338	20	042	9	13	8.47

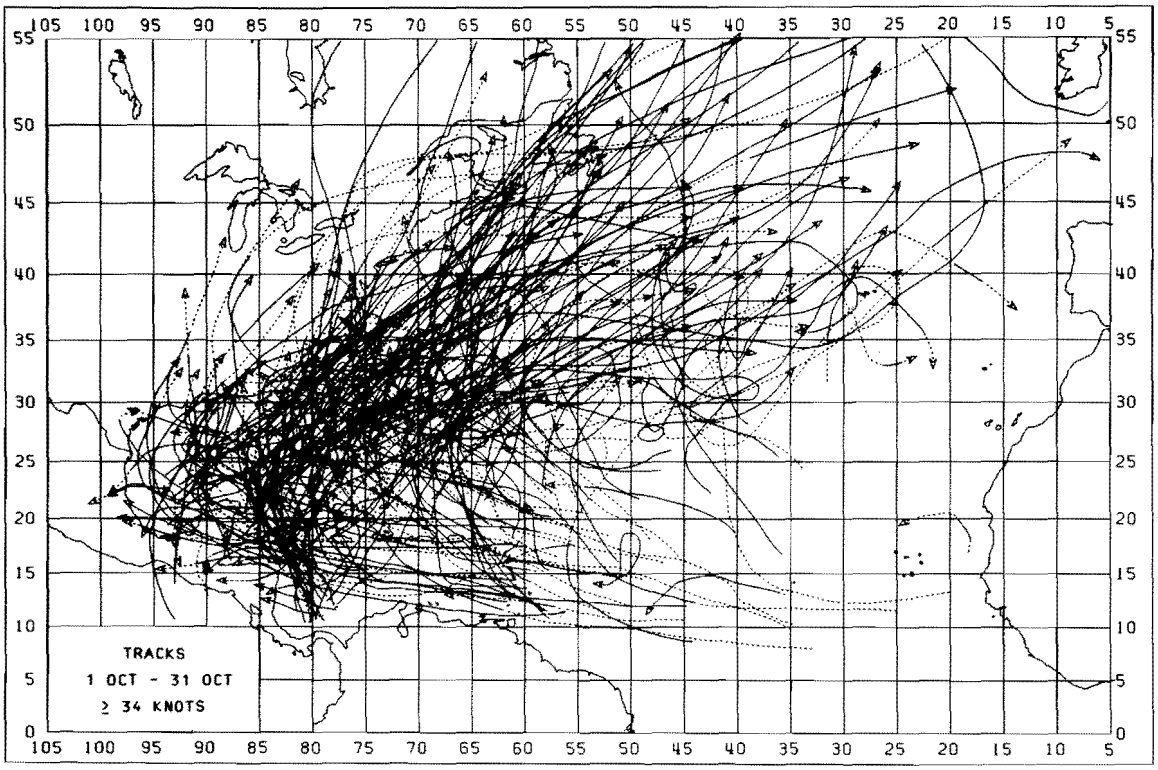
A	B	C	D	E	F
339	21	037	9	13	8.61
340	20	026	10	14	7.00
341	12	021	8	16	6.51
342	18	348	10	13	5.60
343	7	004	8	11	4.23
344	8	004	7	13	4.06
345	6	359	6	11	2.36
347	6	052	8	13	7.31
348	9	008	8	13	8.46
349	9	336	5	10	4.03
350	8	357	7	13	4.83
366	11	359	11	13	3.79
367	14	021	9	12	5.28
368	15	035	11	13	6.79
369	14	044	11	14	6.55
370	20	031	13	19	8.62
371	14	358	9	15	6.60
372	23	030	9	13	7.66
373	27	032	10	14	7.23
374	24	030	11	16	7.11
375	21	023	12	15	5.93
376	19	045	10	16	8.84
377	27	035	12	18	7.70
378	20	045	12	18	7.46
379	14	043	11	16	5.46
380	10	023	10	16	4.60
381	9	055	10	16	8.52
383	9	009	7	13	8.16
384	8	353	14	18	8.48
386	8	032	7	11	4.19
387	6	063	8	11	6.02
402	6	359	15	16	4.56
405	5	042	17	18	6.27
406	13	039	16	18	8.17
407	18	042	17	20	11.15
408	18	039	11	15	9.25
409	17	032	12	17	10.10
410	25	039	12	16	8.52
411	30	032	13	15	6.87
412	22	033	12	15	6.43
413	19	022	15	18	6.35
414	14	034	16	18	7.96
415	11	047	17	20	7.19
416	11	051	17	19	6.87
417	9	051	18	19	9.88
418	7	063	17	20	11.53
419	6	029	16	22	11.49
420	5	030	17	21	8.16
421	6	055	16	18	8.92
423	6	068	12	16	8.18
442	6	034	21	23	6.63
443	7	034	23	24	11.09
444	7	039	17	18	8.52

A	B	C	D	E	F
445	13	042	19	22	9.56
446	14	041	15	18	9.51
447	18	031	21	24	8.46
448	26	036	17	19	7.38
449	22	039	17	20	7.83
450	14	032	19	20	5.75
451	11	045	20	23	9.12
452	10	054	23	25	11.11
453	11	055	21	23	8.57
454	8	063	22	24	8.99
455	10	049	21	25	12.97
456	7	069	25	27	11.57
457	8	070	24	25	9.99
458	9	068	21	23	10.86
459	7	058	20	22	11.61
481	6	034	21	26	13.81
482	10	050	20	22	9.58
483	21	039	20	22	9.56
484	19	039	22	24	11.25
485	21	046	22	25	10.91
486	23	040	20	22	9.13
487	15	049	21	22	10.29
488	10	047	22	23	10.13
489	8	050	30	31	10.31
490	6	052	30	31	9.11
491	8	045	27	28	8.01
492	8	040	25	27	12.28
493	6	060	20	20	12.63
496	6	046	20	21	9.84
519	10	034	19	21	10.41
520	19	041	19	22	10.29
521	18	045	25	27	12.06
522	19	045	29	31	12.52
523	15	054	30	31	13.64
524	18	057	26	27	12.26
525	18	058	25	26	11.31
526	14	062	25	26	13.43
527	10	064	31	33	12.75
528	10	058	29	32	10.26
529	10	059	25	27	13.34
530	6	062	22	23	12.70
531	5	064	22	25	16.10
532	5	056	25	27	18.87
556	5	028	20	21	14.00
557	11	043	19	20	7.71
558	15	039	24	25	11.06
559	14	068	29	31	14.04
560	12	053	32	34	18.96
561	12	052	28	31	10.64
562	12	058	27	30	10.48
563	10	069	30	31	12.22
564	11	072	32	34	13.01
565	10	062	33	35	11.86

A	B	C	D	E	F
566	10	055	31	34	14.05
567	5	072	22	27	16.45
594	8	042	20	22	6.27
595	12	040	27	29	10.20
596	10	052	39	41	22.45
597	11	052	36	39	23.21
598	10	053	38	41	22.02
599	6	059	40	45	26.13
600	9	067	30	33	25.50
601	9	061	24	26	8.99
602	12	034	30	32	10.92
603	9	054	31	33	11.82
605	6	058	31	34	14.43
631	7	041	24	25	6.45
632	10	045	28	29	7.63
633	8	046	27	29	8.37
634	7	049	29	31	8.98
635	10	045	28	32	12.19
636	9	046	28	31	14.37
639	5	041	37	38	8.82
640	6	045	36	37	8.30
642	8	042	34	37	18.86


FREQUENCY
1 OCT - 31 OCT
≥ 34 KNOTS


MOTION
1 OCT - 31 OCT
≥ 34 KNOTS



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118	12	339	5	6	2.76
119	8	358	6	8	2.73
125	6	285	9	10	2.37
126	6	283	9	10	2.52
151	5	261	9	11	2.18
152	8	274	9	10	3.50
153	15	298	6	8	3.85
154	25	321	6	8	2.64
155	7	317	8	10	2.54
156	9	325	5	7	2.81
162	5	272	10	11	5.62
185	6	263	3	8	2.97
186	7	286	5	6	3.96
187	6	306	9	10	3.48
188	11	310	5	9	3.35
189	20	353	6	9	4.07
190	19	011	4	7	3.11
191	11	035	5	9	4.87
192	9	008	7	10	6.85
196	5	314	11	12	2.58
221	8	341	5	8	2.38
222	11	327	6	8	2.29
223	7	298	7	8	1.76
224	12	325	6	8	3.69
225	20	358	7	8	3.62
226	14	013	6	8	3.32
227	13	021	7	9	3.87
228	8	020	9	12	7.32
229	10	011	9	14	5.56
230	8	344	11	14	3.65
231	9	334	12	14	3.92
233	7	326	8	11	2.52
234	5	313	11	12	2.37
257	8	359	6	10	4.17
258	13	011	6	9	4.18
259	8	346	4	9	4.14
260	11	342	4	8	2.94
261	18	017	9	11	3.44
262	15	031	9	11	3.53
263	15	010	9	12	4.42
264	13	003	8	12	4.68
265	13	359	9	14	5.47
266	13	012	11	15	5.37
267	13	352	10	13	5.22
268	5	321	8	11	3.71
269	8	331	9	12	2.73
294	13	007	7	11	6.44
295	14	028	8	14	7.06
296	10	036	6	10	5.85
297	13	024	9	11	4.82
298	18	034	10	13	4.60
299	22	027	10	15	6.32
300	16	023	10	15	7.49
301	14	014	10	16	7.47
302	13	020	10	14	6.70
303	18	031	12	14	6.92
304	12	014	9	14	5.12
305	7	350	5	11	3.71
306	7	357	8	12	2.95
330	9	358	8	12	5.35
331	8	005	12	14	5.80
332	5	041	16	18	15.00
333	12	035	14	16	9.87
334	12	022	9	14	5.28
335	16	022	12	16	6.57
336	23	041	11	15	6.79
337	24	047	12	16	7.46
338	22	052	11	16	8.00
339	19	042	11	16	7.98
340	21	038	13	15	7.10
341	11	045	12	17	7.35
342	11	006	9	13	6.26
343	5	025	10	13	3.41
344	7	024	9	14	4.04
349	7	354	5	11	4.63
350	5	007	4	12	4.30
367	9	027	11	13	6.15
368	9	029	10	12	5.05
369	7	035	8	14	8.21
370	16	019	11	17	9.04
371	15	014	11	17	8.87
372	20	028	7	13	7.58
373	21	027	8	13	6.30
374	19	027	10	16	7.06
375	16	028	13	17	6.32
376	16	054	13	18	9.64
377	23	043	15	19	8.24
378	15	060	18	20	7.48
379	11	060	16	18	6.37
380	9	054	14	18	6.34
381	7	077	13	17	9.07
382	5	105	8	13	9.39
406	6	038	12	14	6.02
407	17	031	16	19	10.32
408	17	040	12	15	10.12
409	13	037	9	14	8.49
410	20	034	12	16	8.33
411	21	024	13	16	6.98
412	14	023	12	16	6.29
413	16	024	15	19	7.91
414	13	038	14	18	9.18
415	11	060	20	21	7.21
416	11	062	16	18	6.75
417	8	064	18	18	10.36
418	9	063	16	18	11.04
419	6	064	13	15	10.29
420	7	022	11	16	8.21
443	7	027	23	25	10.18
444	9	033	21	22	11.77
445	9	044	19	20	10.51
446	10	047	16	18	7.34
447	16	034	22	23	7.04
448	18	037	18	20	4.75
449	17	036	19	21	8.67
450	11	037	20	21	6.33
451	9	056	20	22	9.83
452	9	052	20	22	9.55
453	7	064	19	20	6.52
454	6	067	23	25	9.73
455	19	058	19	22	10.74
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483	15	036	22	24	8.23
484	16	036	23	24	8.66
485	16	041	24	26	9.38
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487	13	048	25	26	9.23
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489	7	058	25	27	12.36
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527	7	064	31	32	12.15
528	11	053	22	24	10.00
529	9	058	22	23	7.60
530	5	052	28	29	12.26
556	6	031	24	26	14.00
557	10	043	20	20	8.79
558	12	036	20	21	8.23
559	11	051	29	32	13.13
560	10	051	39	42	14.77
561	8	053	33	36	9.79
562	8	062	30	33	9.55
563	6	073	34	36	10.82
564	6	073	32	35	13.95
565	7	063	25	27	10.77
594	10	040	20	21	6.52
595	7	038	24	25	8.34
596	6	052	45	49	23.35
597	9	054	44	47	19.95
598	7	060	44	47	23.03
605	6	059	36	40	6.41
631	7	042	24	25	6.25
632	9	049	28	30	5.90
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634	6	048	36	38	6.07
635	10	045	32	35	12.63
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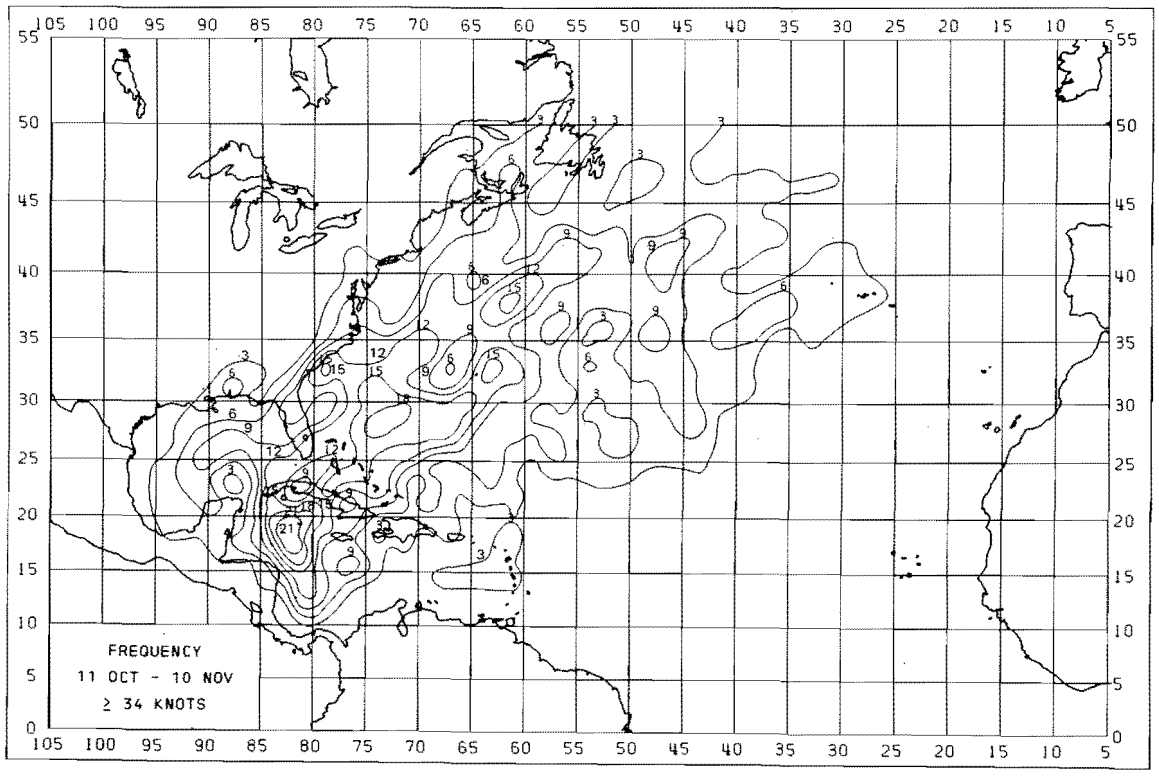
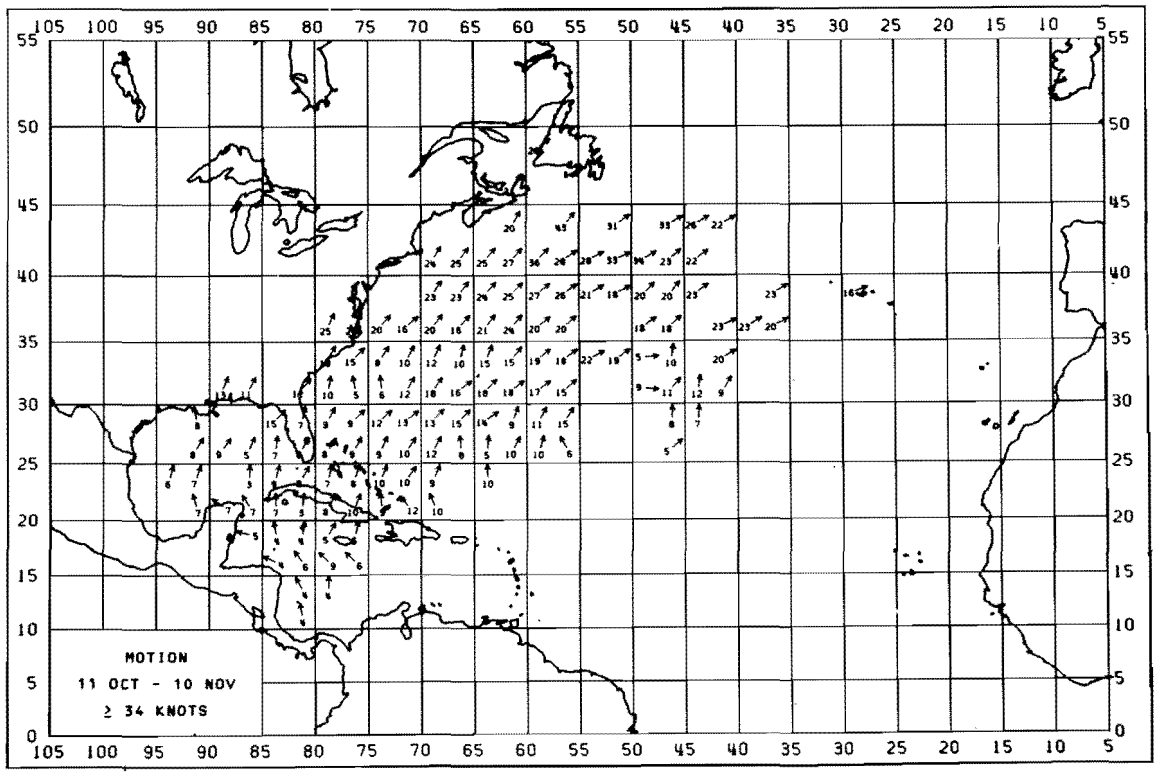

FREQUENCY
11 OCT - 10 NOV
≥ 34 KNOTS


MOTION
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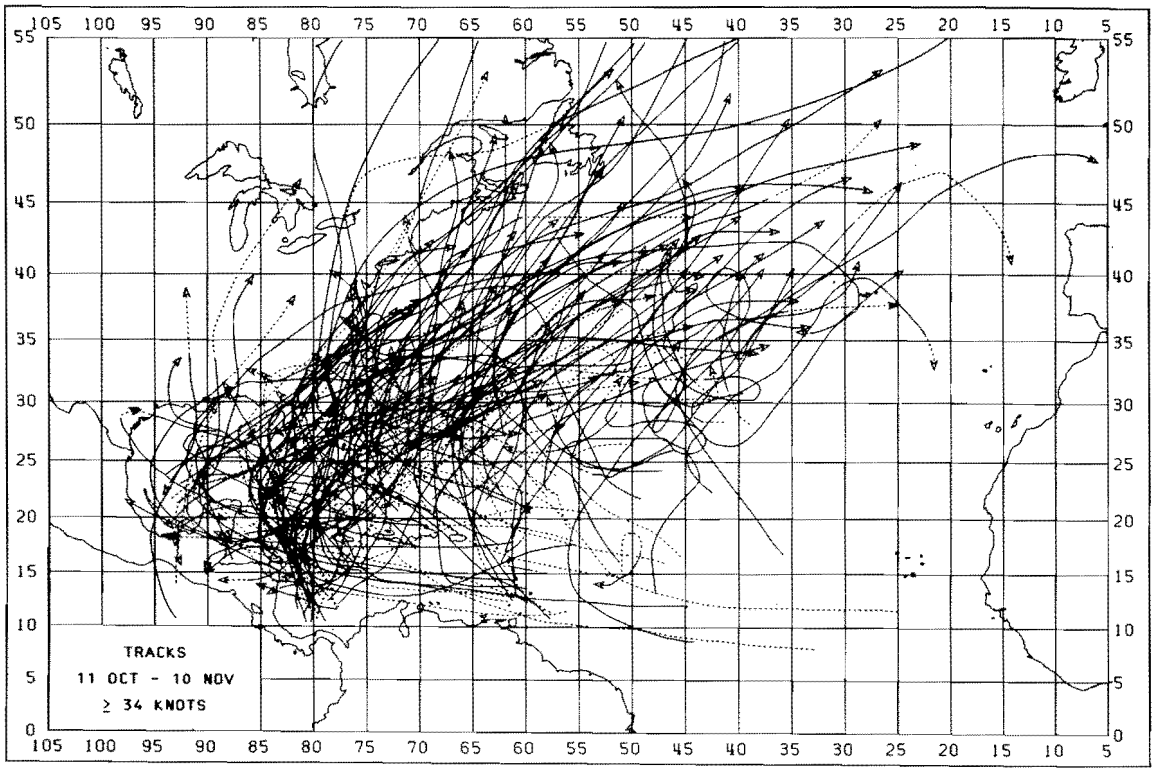

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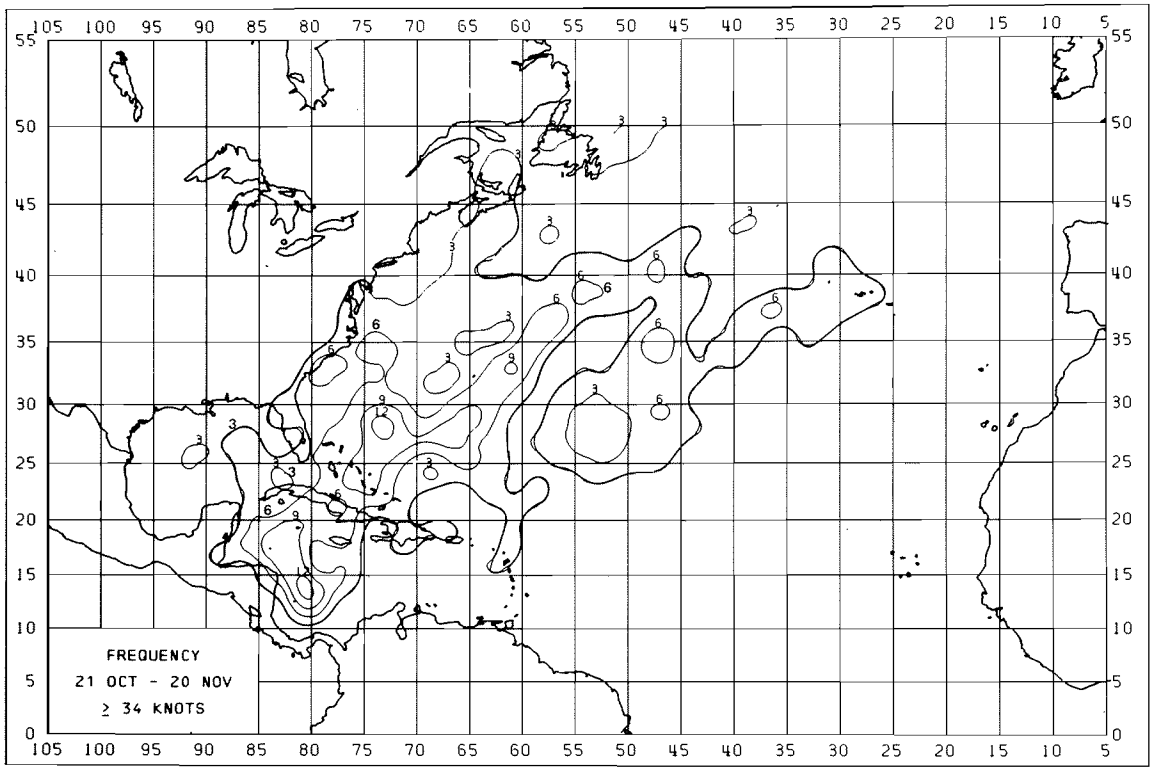
119	9	001	4	7	2.55
153	11	294	4	7	2.95
154	21	325	6	7	2.55
155	8	314	9	10	3.54
156	9	314	6	8	4.37
188	7	283	5	9	3.06
189	19	350	4	9	3.86
190	20	010	4	7	3.06
191	13	029	5	9	4.76
192	10	012	6	9	6.85
222	7	343	7	9	2.04
223	6	305	7	8	1.78
224	6	327	7	9	4.77
225	16	000	7	8	4.10
226	13	007	3	8	3.71
227	14	028	8	11	3.88
228	9	022	10	12	7.74
229	11	353	9	13	6.09
230	6	319	12	14	4.38
231	7	337	10	13	4.10
257	6	015	6	11	4.69
258	8	019	7	11	4.58
260	6	002	3	8	3.85
261	14	016	9	10	3.16
262	10	030	8	12	3.54
263	13	011	7	12	4.29
264	17	016	8	12	4.32
265	14	022	10	14	5.44
266	7	035	10	13	6.05
267	6	022	9	13	2.89
269	7	358	10	16	5.52
294	8	031	8	13	7.42
295	10	036	9	15	7.46
296	9	024	5	10	6.48
297	9	007	7	9	3.53
298	13	030	8	12	4.23
299	14	035	8	14	5.91
300	15	028	9	14	7.88
301	16	025	9	16	7.59
302	15	035	10	15	6.49
303	13	028	12	16	7.10
304	10	334	8	14	5.35
305	7	005	5	11	4.21
306	6	028	10	15	5.85
307	5	016	10	13	7.23
308	6	331	6	10	3.02
312	6	052	5	12	8.40
330	6	349	8	14	5.54
333	8	045	15	16	12.10
334	10	014	7	13	4.65
335	8	028	9	12	5.99

A	B	C	D	E	F
336	15	045	9	15	7.48
337	19	050	12	17	7.12
338	18	053	13	18	7.89
339	15	044	13	18	7.30
340	15	043	15	17	7.23
341	9	057	14	16	6.47
342	7	018	9	12	3.89
343	5	028	11	14	4.30
344	6	032	15	18	4.95
348	6	002	8	19	9.80
349	8	004	7	17	11.48
367	6	023	13	14	6.67
368	5	028	11	15	5.86
370	10	041	12	17	11.03
371	12	008	10	16	9.89
372	15	349	5	12	5.88
373	16	354	6	11	3.19
374	11	028	12	15	7.51
375	8	035	18	20	5.26
376	11	034	16	22	8.60
377	14	045	18	22	7.64
378	12	053	18	20	8.01
379	9	056	17	19	6.43
380	6	050	15	18	6.28
383	6	096	9	15	11.74
384	8	040	11	18	11.75
385	6	010	12	16	9.65
386	6	030	9	13	10.46
407	13	030	18	21	9.83
408	11	044	15	17	9.76
409	10	034	8	14	6.71
410	15	028	10	15	7.37
411	13	026	12	17	8.01
412	7	013	10	16	6.38
413	14	021	15	18	8.10
414	12	038	15	19	9.38
415	9	053	19	20	7.46
416	6	054	18	20	5.40
417	6	062	22	23	8.04
418	5	054	19	20	10.62
419	7	085	5	11	6.94
420	8	007	10	13	7.48
422	5	060	20	22	14.77
443	5	026	25	27	10.52
444	7	030	20	22	12.71
445	7	043	20	21	10.96
446	9	050	16	19	6.66
447	11	038	20	22	7.57
448	11	043	16	19	4.90
449	12	038	21	24	11.48
450	10	039	24	25	10.38
451	8	052	20	22	10.44
452	10	048	20	21	9.43

A	B	C	D	E	F
455	8	055	18	24	9.27
456	8	048	18	21	12.30
458	6	066	23	24	12.88
459	8	059	23	24	10.31
460	6	060	20	22	8.03
483	11	032	23	26	7.63
484	7	037	23	25	7.64
485	8	043	24	26	8.53
486	14	045	25	26	10.53
487	13	050	27	28	10.68
488	7	054	26	27	11.31
489	9	060	21	23	12.86
490	7	064	18	19	13.09
491	8	046	20	22	10.47
492	9	038	20	22	11.55
493	5	054	23	24	14.53
496	6	055	23	24	8.55
499	6	071	16	20	6.81
519	6	031	24	27	11.65
520	8	037	25	27	9.11
521	7	040	25	26	10.41
522	6	042	27	29	14.01
523	8	044	36	37	9.66
524	10	056	28	31	13.58
525	10	062	28	30	11.75
526	7	066	33	34	11.87
527	8	061	34	35	14.10
528	10	049	23	25	11.01
529	7	054	22	23	6.90
558	6	028	20	20	9.20
560	5	038	43	45	18.41
562	6	053	31	31	9.96
564	6	060	33	34	14.27
565	6	059	26	27	11.25
566	6	060	22	24	10.45
594	6	034	21	23	7.63
631	5	052	26	27	7.78


FREQUENCY
21 OCT - 20 NOV
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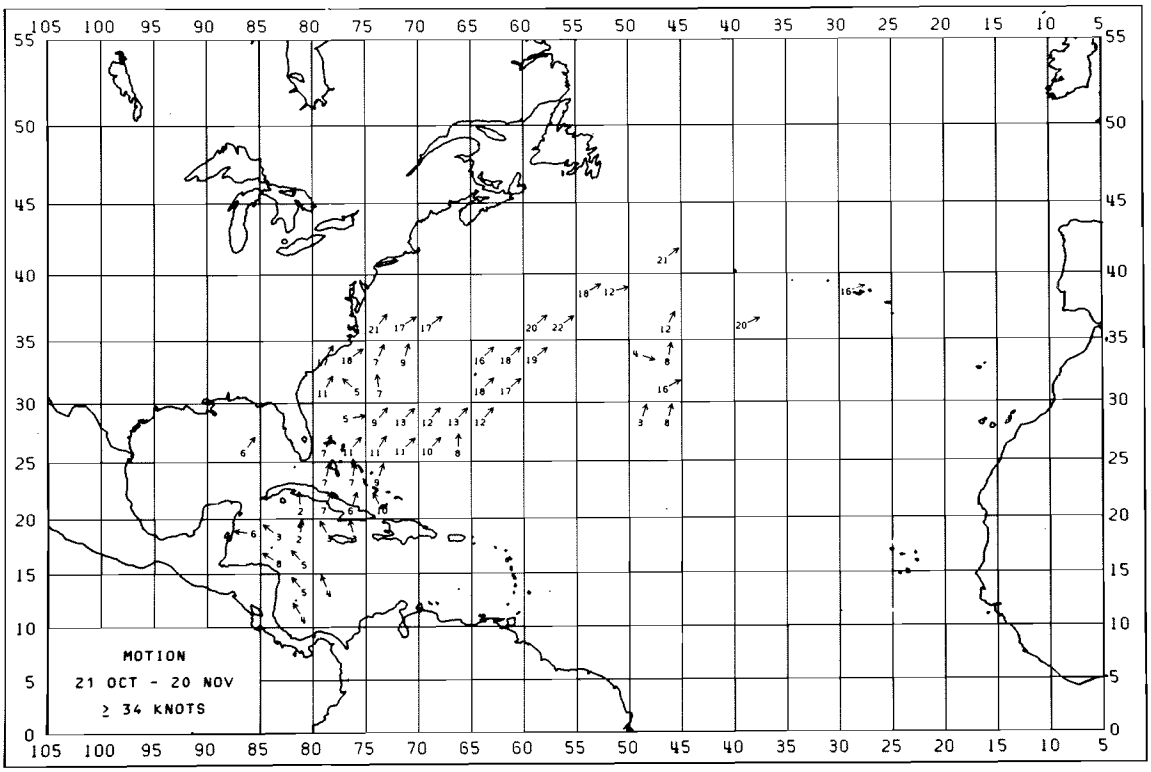
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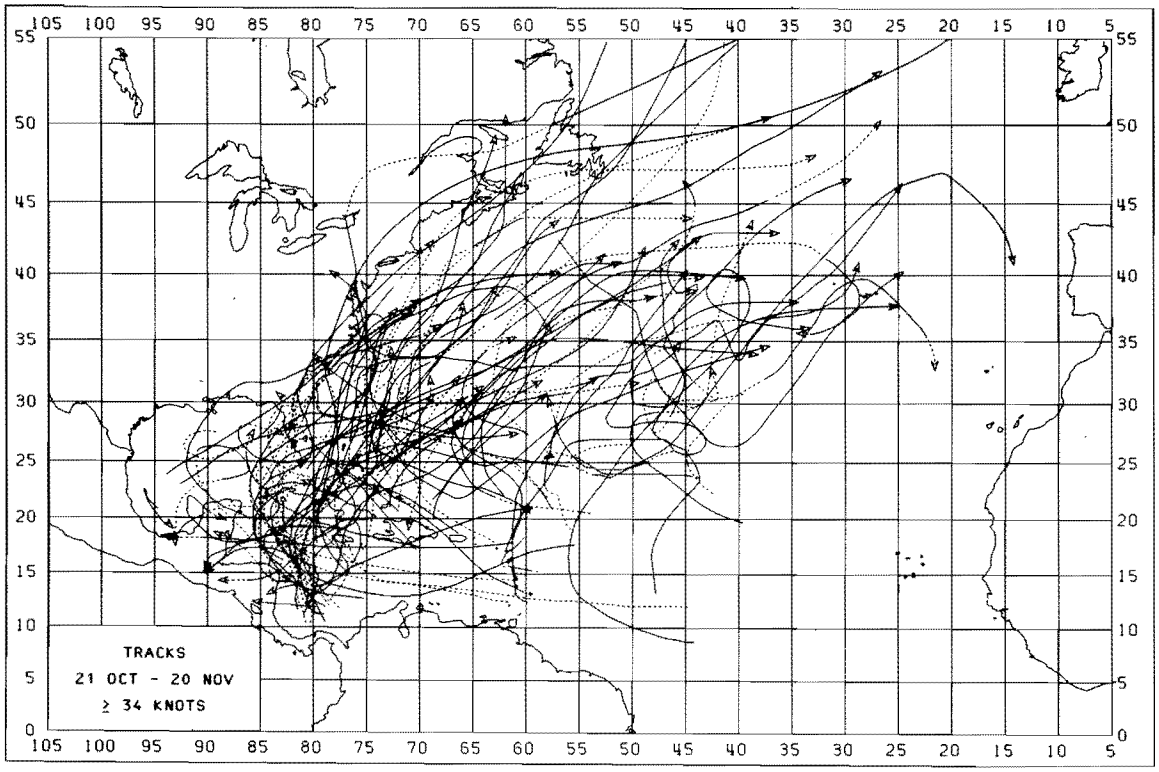

A	B	C	D	E	F
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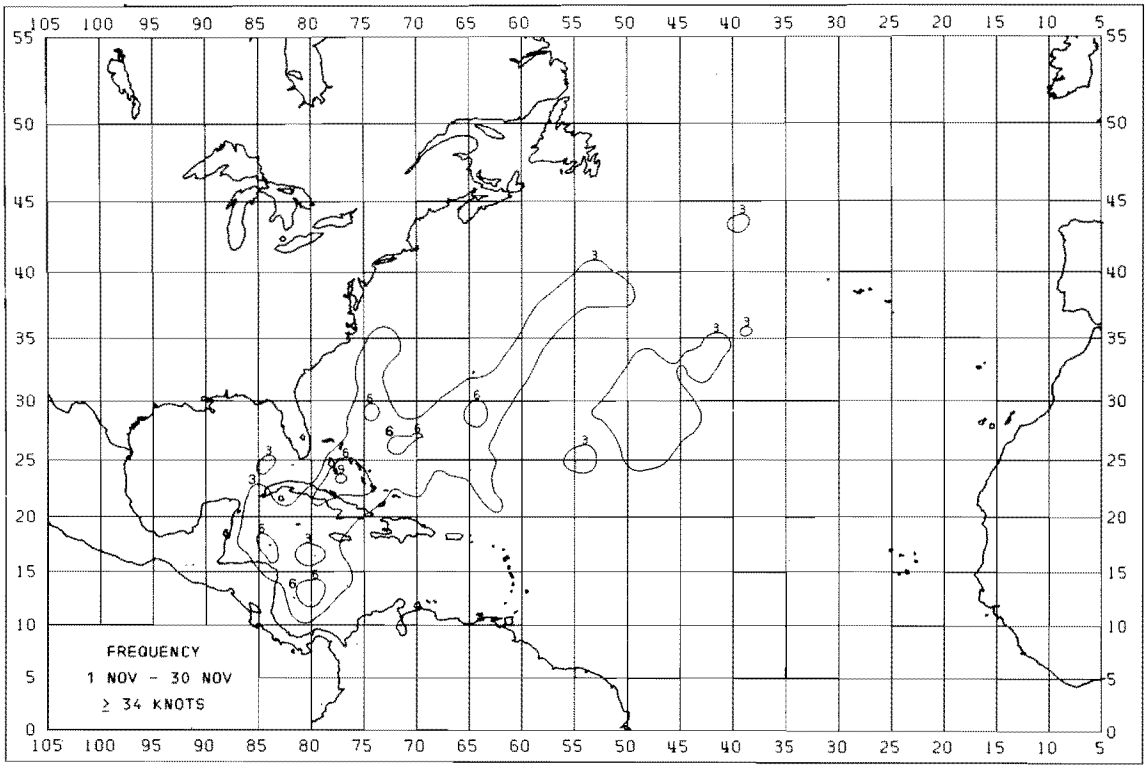
119	9	336	4	6	2.87
153	9	303	8	10	3.62
154	10	318	5	7	2.25
188	6	278	6	8	2.81
189	9	308	3	9	3.43
190	9	008	2	7	2.66
191	8	332	3	6	3.43
192	7	346	3	6	2.05
226	7	355	2	9	3.82
227	6	023	7	12	4.08
228	6	017	6	9	6.37
229	6	333	10	12	4.81
263	7	013	7	12	4.19
264	10	009	7	12	4.90
265	9	019	9	12	3.85
296	5	035	6	9	8.25
299	6	021	7	14	3.78
300	8	039	11	14	8.42
301	10	032	11	13	6.70
302	10	047	11	16	6.17
303	7	043	10	16	5.98
304	9	002	8	14	4.22
336	6	081	5	13	6.58
337	13	040	9	15	5.43
338	9	044	13	17	5.77
339	6	040	12	16	3.09
340	10	044	13	15	5.89
341	8	041	12	14	7.10
347	5	017	3	12	4.50
348	5	013	8	20	9.85
371	5	029	11	15	13.38
372	5	312	5	11	4.42
373	7	352	7	11	4.20
377	6	046	18	18	5.49
378	7	050	17	18	5.85
384	6	062	16	20	14.41
407	7	033	17	21	11.01
408	5	055	18	20	14.58
409	6	023	7	13	6.49
410	5	016	9	13	4.58
413	5	046	16	19	8.85
414	8	048	18	21	7.11
415	7	051	19	20	6.12
419	5	108	4	10	5.16
420	5	010	8	12	8.29
445	6	039	21	23	11.10
446	6	056	17	18	5.59
447	6	054	17	18	4.33
451	9	050	20	22	8.62
452	7	053	22	22	8.39
456	5	027	12	14	8.76

A	B	C	D	E	F
459	5	067	20	22	11.44
489	8	060	18	20	10.30
490	5	076	12	13	6.06
499	6	071	16	20	6.81
528	5	052	21	22	13.61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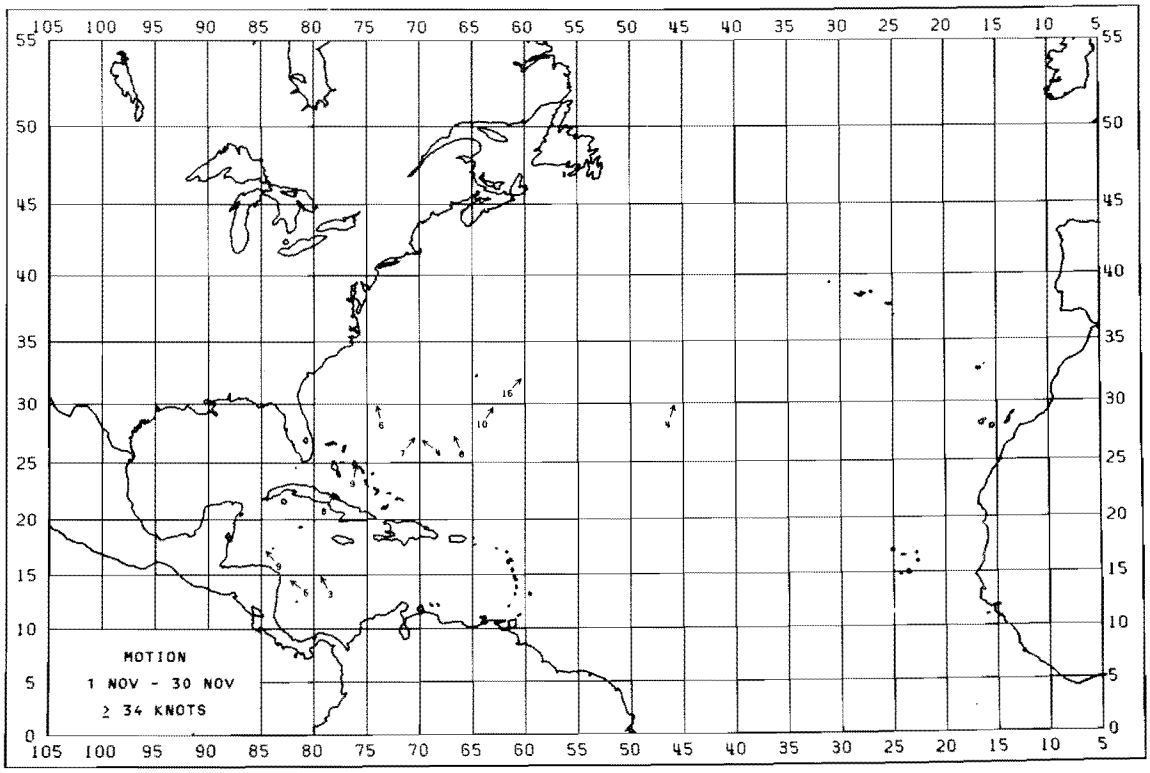
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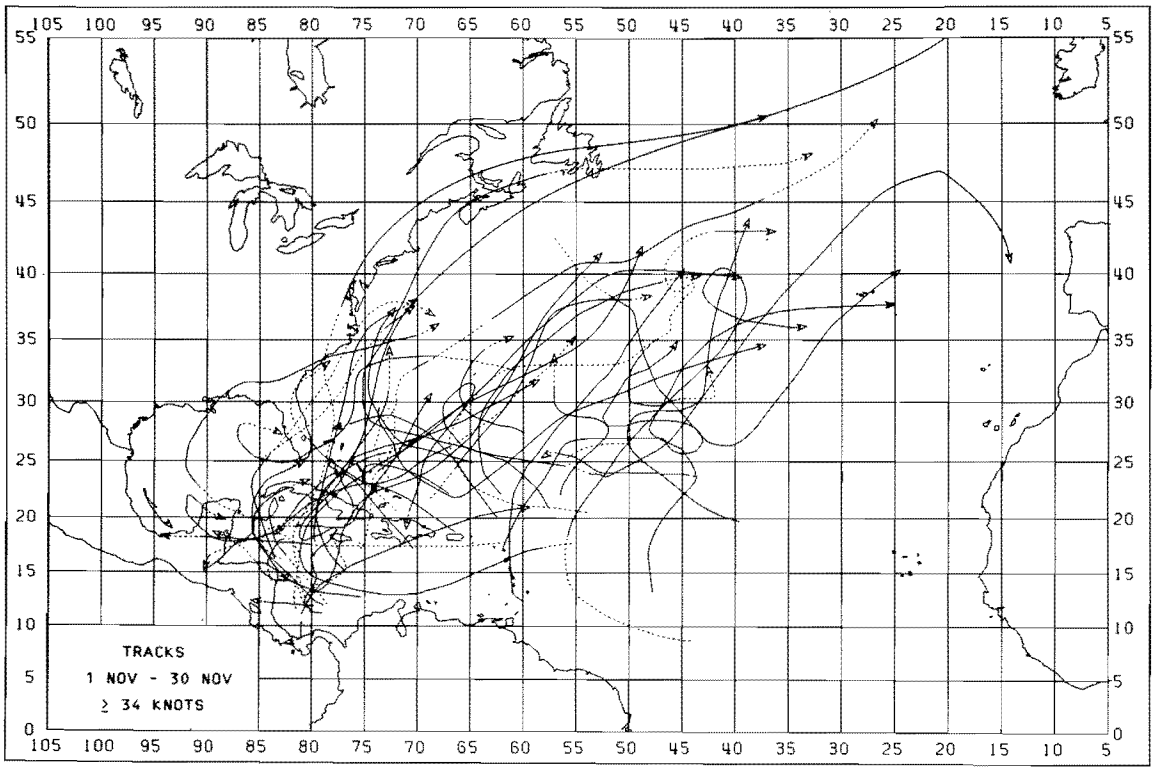

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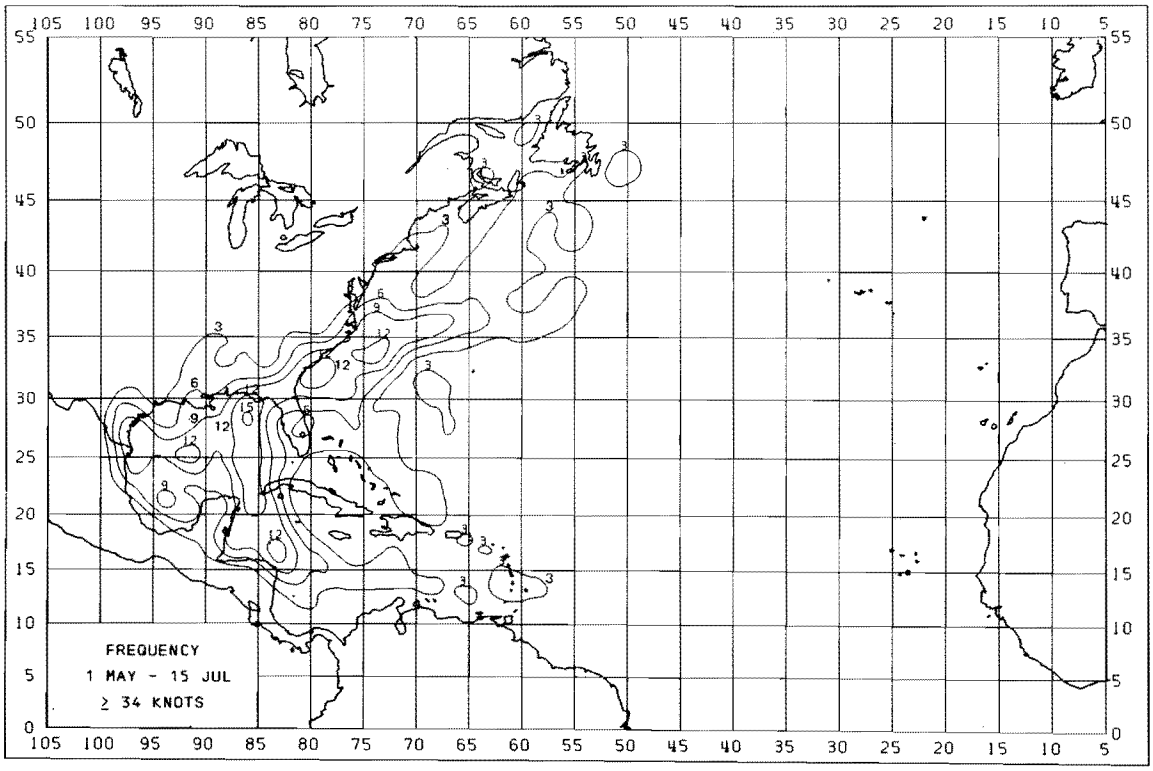
153	6	319	9	11	3.94
227	6	030	8	14	3.11
264	9	011	9	14	5.32
302	6	036	7	14	5.42
303	6	307	4	14	4.46
304	6	337	8	14	4.63
337	6	347	6	14	5.73
341	6	033	10	13	6.65
348	5	018	4	19	11.70
378	5	043	16	17	5.49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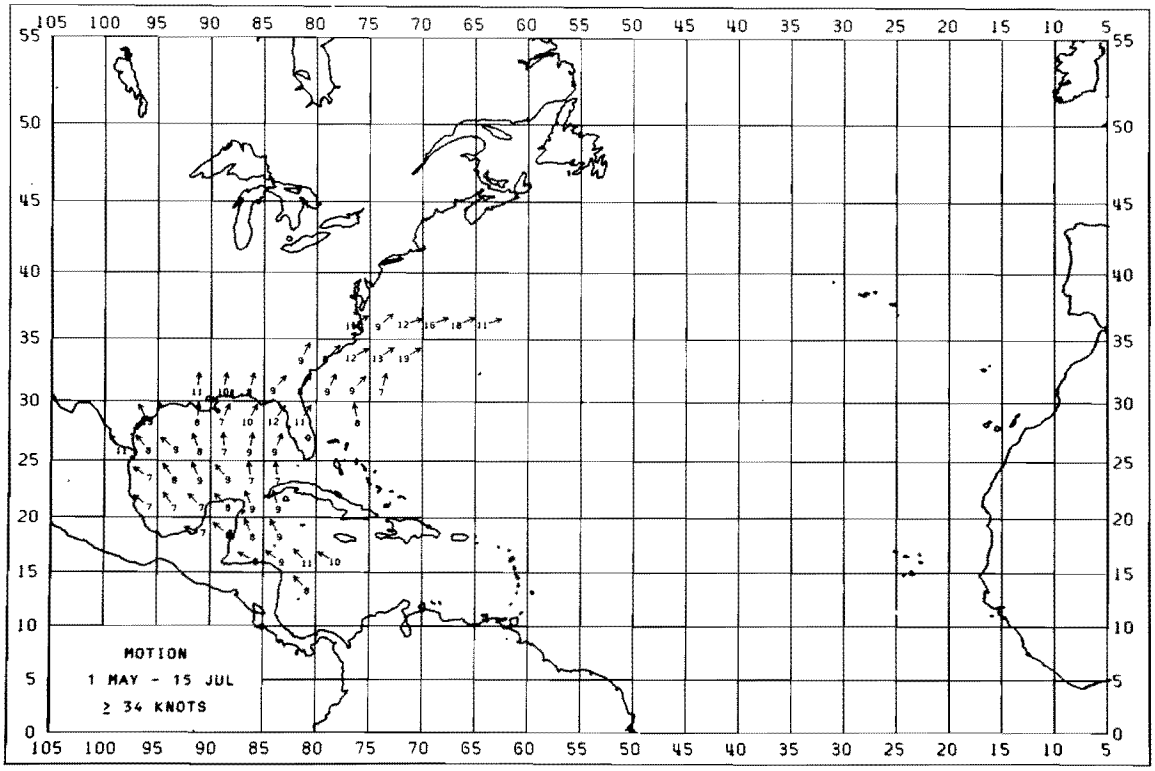
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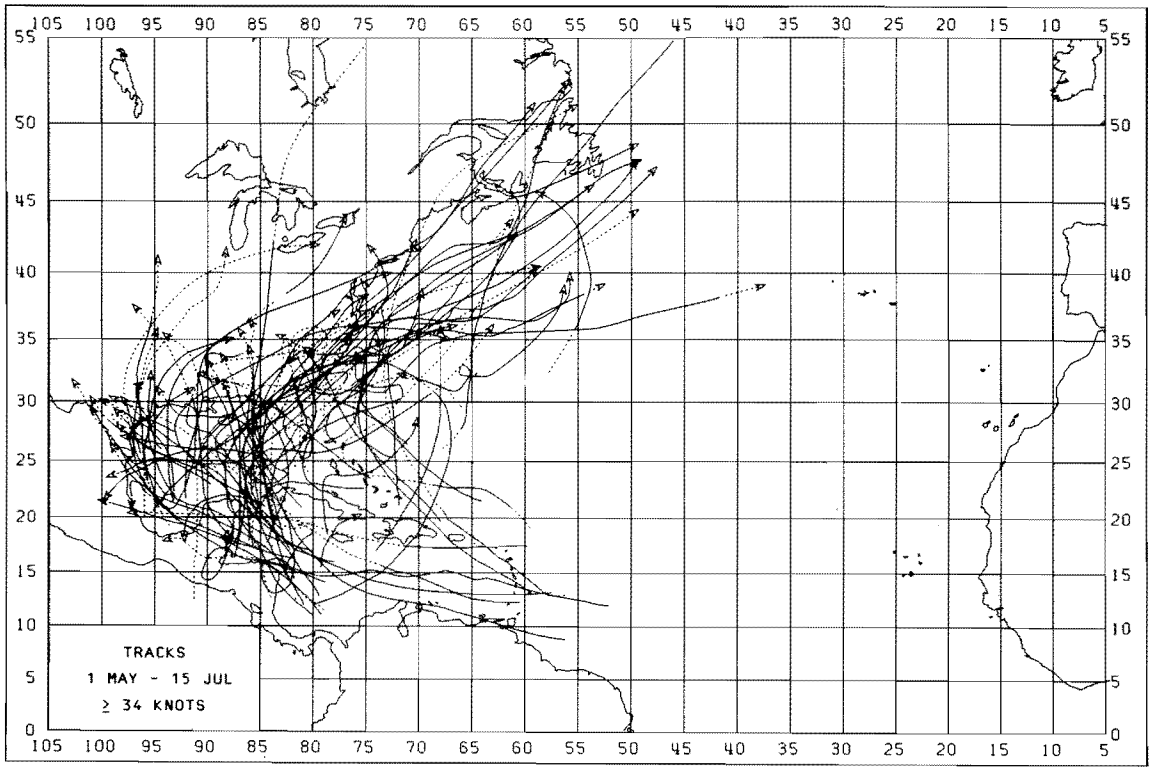

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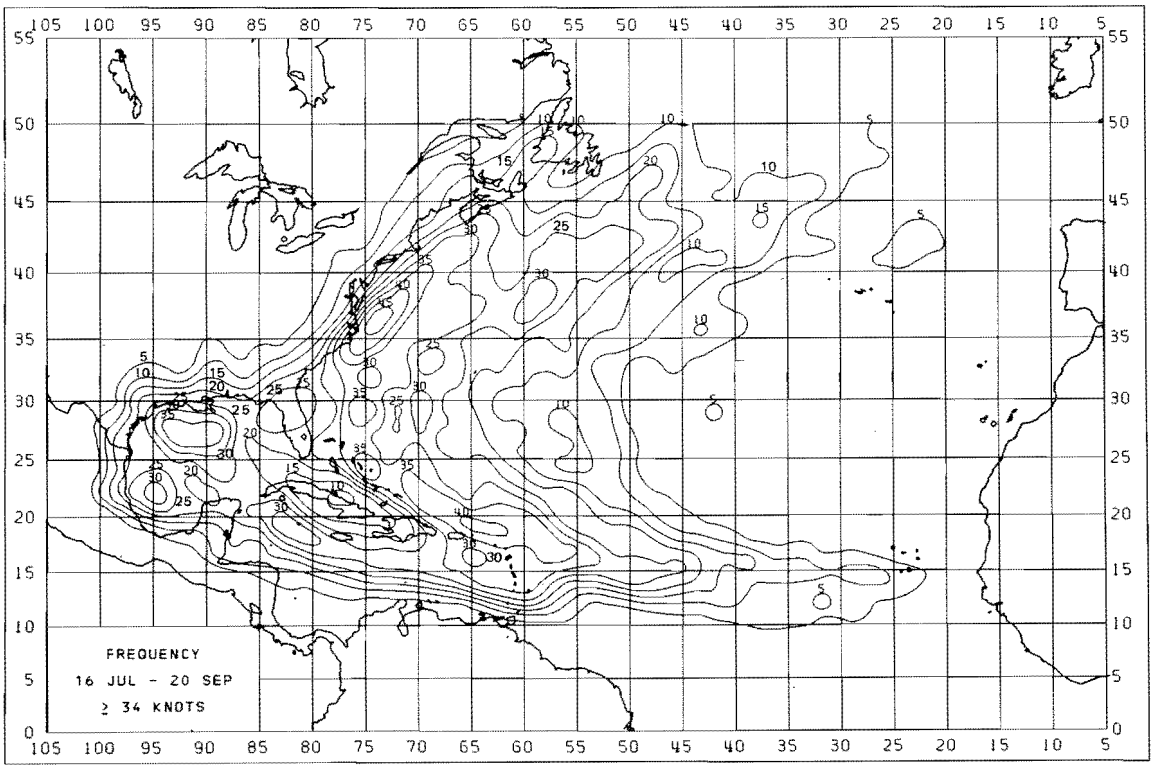
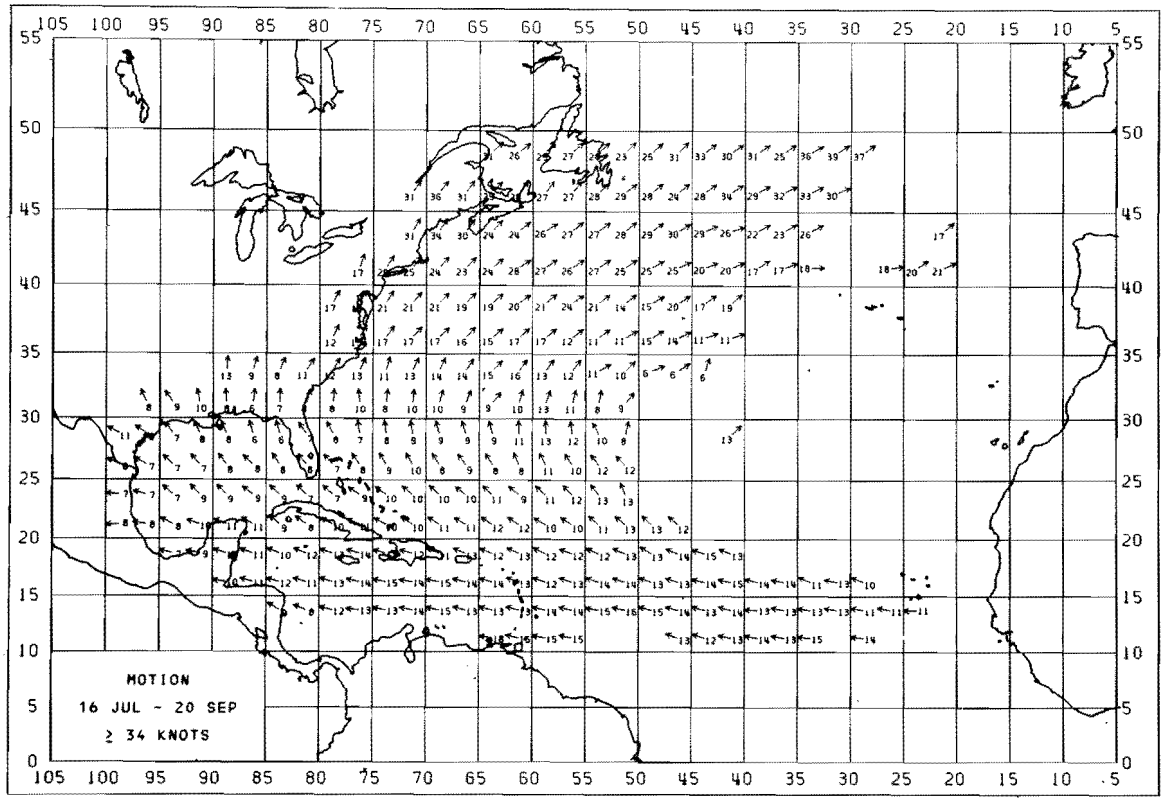
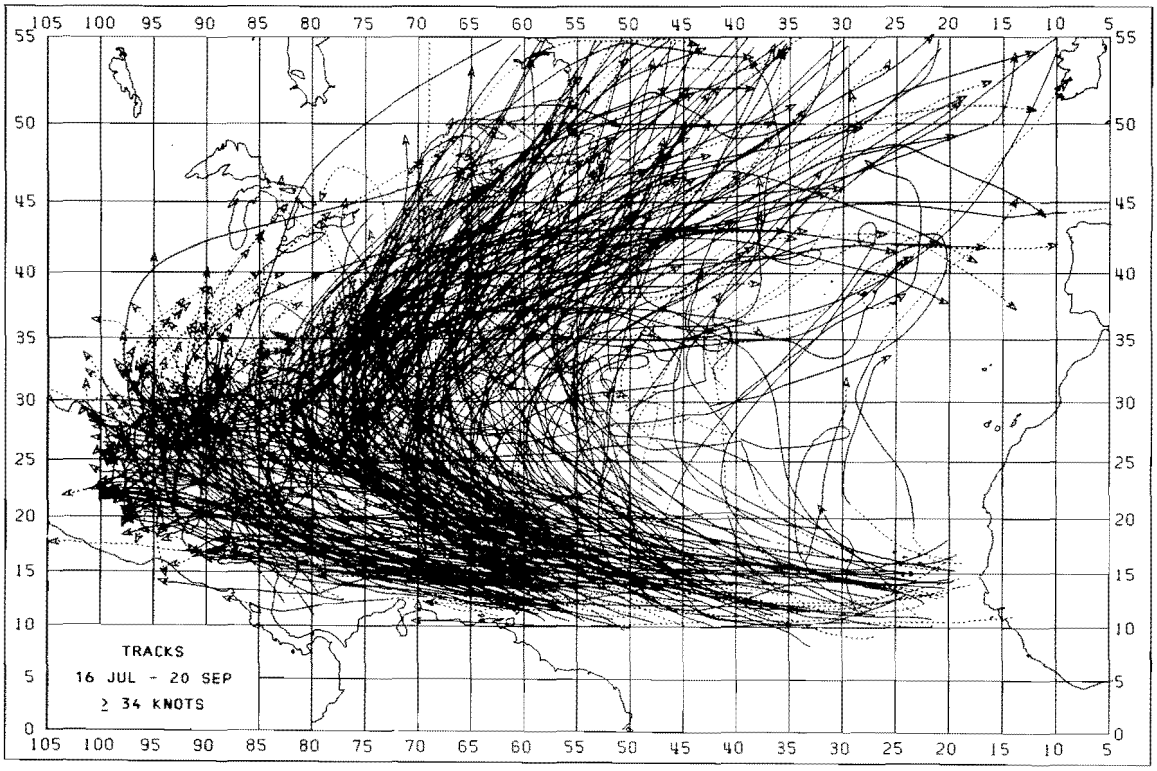
154	8	316	11	12	3.77
155	6	301	10	11	4.75
186	5	288	7	8	3.08
187	7	309	8	9	2.58
188	10	335	8	9	2.58
189	10	332	9	10	3.24
220	5	307	7	8	3.05
221	10	326	7	9	3.97
222	7	317	7	10	5.04
223	6	316	8	9	1.56
224	12	338	9	11	2.52
225	11	345	9	10	3.43
256	9	304	7	9	3.21
257	6	326	8	10	3.72
258	10	336	9	11	4.84
259	7	321	9	10	4.21
260	13	351	7	9	4.05
261	9	353	7	8	2.80
291	6	323	11	11	3.79
292	12	321	8	9	4.47
293	10	309	9	11	3.10
294	11	338	8	11	4.27
295	9	355	7	11	3.96
296	14	009	9	11	7.31
297	9	020	9	13	8.67
328	6	334	13	14	3.61
330	7	003	8	10	3.51
331	8	022	7	11	3.18
332	16	029	10	12	6.61
333	8	036	12	16	6.57
334	6	032	11	13	8.22
336	7	349	8	10	3.68
366	6	006	11	13	4.36
367	5	010	10	13	6.40
368	9	014	8	10	5.88
369	10	039	9	15	6.38
370	11	030	8	14	4.93
371	13	023	9	14	8.45
372	9	042	9	14	9.75
373	6	013	7	14	5.31
406	7	026	9	14	8.55
407	10	046	8	11	5.04
408	12	062	12	14	9.39
409	13	056	13	16	11.23
410	7	058	19	20	14.25
444	7	059	11	14	4.53
445	10	049	9	12	4.54
446	9	073	12	12	7.53
447	11	069	16	17	14.92
448	10	067	18	19	14.67

A	B	C	D	E	F
449	7	073	11	13	4.11


FREQUENCY
16 JUL - 20 SEP
≥ 34 KNOTS


MOTION
16 JUL - 20 SEP
≥ 34 KNOTS



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89	5	279	18	18	4.90
90	11	283	16	17	4.73
91	13	280	15	16	4.94
92	9	282	15	15	5.46
96	6	289	13	14	2.96
97	6	288	12	12	3.58
98	8	282	13	13	3.97
99	9	281	14	14	3.47
100	10	280	13	14	4.27
101	7	276	15	15	4.54
103	7	276	14	15	4.85
117	5	302	9	10	1.52
118	6	292	8	10	2.83
119	7	283	12	12	4.51
120	10	276	13	13	4.91
121	14	280	13	13	4.75
122	16	281	14	14	5.38
123	19	281	15	15	4.98
124	24	284	13	13	5.06
125	32	284	13	14	4.01
126	32	284	13	13	4.22
127	27	284	14	15	4.87
128	18	283	14	15	4.23
129	18	281	15	16	4.41
130	24	282	16	17	4.30
131	24	285	15	15	4.51
132	21	284	14	15	3.96
133	18	285	13	14	3.55
134	15	285	14	14	3.08
135	9	274	13	13	4.01
136	9	281	13	14	2.42
137	9	279	13	14	3.55
138	9	280	13	13	4.45
139	10	281	11	12	4.54
140	9	282	11	12	3.62
141	8	270	11	12	4.67
151	10	279	10	11	4.85
152	13	286	11	12	4.73
153	14	285	12	12	4.13
154	18	286	11	12	4.17
155	23	286	13	13	5.24
156	25	283	14	15	5.10
157	27	281	15	15	4.92
158	27	280	14	14	5.02
159	28	281	15	15	5.25
160	30	284	14	14	4.84
161	29	286	14	14	4.12
162	31	289	13	13	4.40
163	35	288	12	12	4.30
164	36	288	13	14	5.94
165	31	288	14	15	5.72
166	25	288	14	15	5.30
167	24	289	13	14	4.47

A	B	C	D	E	F
168	23	288	13	13	4.07
169	20	283	14	14	4.40
170	16	282	15	15	6.17
171	15	284	14	14	6.77
172	8	280	14	14	4.59
173	10	291	11	13	4.37
174	5	281	13	14	4.30
175	7	291	10	11	4.22
185	9	284	7	8	3.80
186	9	282	9	10	3.64
187	13	288	10	11	3.55
188	18	289	11	11	3.29
189	27	292	10	11	3.88
190	35	291	12	12	3.69
191	23	288	13	13	4.86
192	19	287	14	14	3.73
193	18	285	13	13	3.06
194	15	285	12	12	2.68
195	28	293	11	12	3.16
196	36	292	13	13	3.01
197	42	292	12	13	3.47
198	40	295	13	13	4.23
199	40	295	12	13	4.32
200	28	290	12	13	3.00
201	22	293	12	13	3.87
202	19	293	13	14	4.72
203	19	300	13	14	4.90
204	11	292	14	14	7.06
205	7	288	15	16	4.89
206	6	290	13	14	2.75
219	12	266	8	9	5.13
220	24	278	8	9	4.12
221	30	297	8	10	3.72
222	21	288	10	11	3.20
223	20	291	11	12	3.11
224	24	301	11	11	3.57
225	26	311	9	11	3.64
226	16	306	8	10	3.55
227	10	297	10	11	2.19
228	10	292	11	11	3.63
229	16	296	10	11	3.36
230	30	302	10	11	3.85
231	40	303	11	12	4.26
232	37	299	11	12	4.76
233	32	303	12	13	4.97
234	35	302	12	12	4.50
235	28	310	10	11	4.53
236	22	302	10	11	3.66
237	19	311	11	12	4.98
238	13	310	13	14	5.42
239	9	311	13	13	3.73
240	6	309	12	14	5.01
255	14	275	7	9	3.82

A	B	C	D	E	F
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257	25	312	7	10	4.47
258	20	316	9	11	4.51
259	27	316	9	11	3.83
260	22	307	9	10	2.76
261	17	313	9	10	3.12
262	15	314	7	9	2.66
263	18	312	7	9	2.79
264	26	303	9	10	3.40
265	35	307	10	11	3.56
266	35	310	10	11	3.98
267	31	312	10	11	4.42
268	28	307	10	11	4.83
269	28	313	11	12	4.15
270	22	310	9	10	3.58
271	15	312	11	11	5.06
272	11	316	12	13	3.25
273	10	322	13	15	5.85
274	10	337	13	15	5.46
291	15	294	8	8	3.00
292	23	299	7	9	3.46
293	29	312	7	9	3.91
294	35	318	7	9	3.55
295	33	322	8	10	3.53
296	18	312	8	10	3.54
297	22	326	8	10	3.32
298	23	322	8	11	3.11
299	28	318	7	9	3.45
300	32	325	8	10	4.18
301	29	330	9	10	3.51
302	30	330	10	12	5.48
303	26	328	8	10	3.86
304	24	322	9	10	4.36
305	22	328	8	11	4.37
306	14	335	8	11	3.65
307	14	333	11	14	4.92
308	12	325	10	13	4.32
309	10	322	12	14	7.04
310	11	314	12	14	4.34
327	9	298	11	11	3.31
328	21	304	8	10	4.16
329	34	323	7	9	4.04
330	31	335	8	10	4.63
331	32	337	8	11	4.26
332	25	343	6	10	5.01
333	28	344	6	10	4.44
334	27	323	7	10	3.91
335	21	333	8	10	4.04
336	37	351	7	10	4.65
337	34	352	8	11	4.46
338	27	350	9	12	4.07
339	31	344	9	12	4.18
340	23	343	9	11	4.75

A	B	C	D	E	F
341	20	345	9	12	4.06
342	13	357	11	14	4.90
343	13	000	13	16	7.50
344	9	351	12	15	8.35
345	12	332	10	12	3.93
346	7	013	8	11	4.54
350	5	047	13	18	4.49
364	15	336	8	8	3.16
365	13	323	9	11	4.02
366	16	348	10	13	4.02
367	16	355	8	11	4.78
368	14	007	6	10	6.19
369	22	001	7	12	7.04
370	22	017	8	13	6.55
371	26	005	8	11	4.88
372	29	354	10	11	3.98
373	30	007	8	11	4.56
374	32	005	10	13	6.14
375	28	014	10	12	6.35
376	26	020	9	12	5.93
377	17	039	9	13	4.67
378	15	015	10	13	7.55
379	12	020	13	16	7.70
380	13	015	11	15	6.31
381	12	010	8	12	5.43
382	7	039	9	12	8.33
403	9	005	13	14	8.54
404	5	016	9	9	4.91
405	8	023	8	10	6.16
406	14	035	11	14	8.20
407	25	030	12	15	7.39
408	40	025	13	14	6.55
409	34	016	11	14	5.36
410	30	025	13	15	6.66
411	24	025	14	15	7.20
412	27	033	14	15	7.03
413	21	045	15	18	7.47
414	21	037	16	17	7.00
415	16	037	13	15	7.66
416	20	039	12	14	5.49
417	11	063	11	13	5.73
418	9	046	10	13	7.06
419	6	069	6	10	4.47
420	7	056	6	10	4.56
421	7	018	6	8	4.31
443	11	024	12	15	5.44
444	29	031	15	17	8.53
445	48	036	17	19	7.12
446	34	042	17	19	8.02
447	36	047	17	19	7.04
448	33	043	16	18	6.89
449	28	050	15	17	8.27
450	29	049	17	18	9.33

A	B	C	D	E	F
451	27	051	17	19	9.14
452	22	053	12	15	6.22
453	18	054	11	15	7.44
454	18	062	11	16	8.27
455	13	059	15	18	8.77
456	8	066	14	17	9.50
457	10	072	11	13	6.43
458	9	072	11	13	6.69
479	6	028	17	18	7.11
480	12	028	19	21	7.34
481	26	031	21	23	8.62
482	40	041	21	23	8.78
483	32	044	21	24	9.89
484	32	045	19	22	10.04
485	26	049	19	21	10.75
486	26	055	20	21	9.08
487	30	052	21	23	9.70
488	27	057	24	25	9.15
489	22	053	21	22	9.19
490	18	052	14	17	8.16
491	10	061	15	18	6.94
492	9	059	20	21	9.28
493	9	056	17	18	10.97
494	6	049	19	20	9.51
516	6	019	17	20	11.20
517	13	034	26	27	11.07
518	22	037	25	26	11.00
519	31	042	24	25	10.67
520	33	045	23	24	8.26
521	28	051	24	26	11.95
522	22	057	28	29	12.19
523	26	056	27	29	10.97
524	25	057	26	28	9.35
525	28	056	27	29	9.97
526	28	056	25	27	10.27
527	22	060	25	26	8.81
528	12	065	25	26	7.11
529	9	070	20	22	9.38
530	9	068	20	21	7.61
531	12	057	17	20	6.26
532	7	070	17	20	7.19
533	5	088	18	20	8.35
536	6	084	18	20	11.81
537	7	056	20	25	12.68
538	5	066	21	27	11.63
554	11	031	31	32	10.45
555	15	033	34	35	14.56
556	22	037	30	31	12.18
557	28	044	24	25	9.20
558	21	052	24	26	8.86
559	17	059	26	28	9.26
560	22	052	27	30	8.10
561	20	054	27	28	8.17

A	B	C	D	E	F
562	25	052	28	30	10.09
563	20	056	29	31	11.12
564	20	061	30	32	8.63
565	17	068	29	31	9.82
566	13	074	26	27	10.65
567	15	062	22	24	10.80
568	14	060	23	25	10.89
569	7	063	26	28	8.92
574	5	049	17	25	13.90
590	6	034	31	34	7.18
591	9	039	36	38	12.58
592	15	037	31	33	13.67
593	15	042	29	30	14.61
594	18	040	28	28	10.83
595	13	036	27	29	8.34
596	10	041	27	30	9.22
597	12	050	28	31	9.30
598	18	054	29	30	7.89
599	22	052	28	30	9.44
600	17	052	24	26	9.91
601	11	055	28	30	9.73
602	12	058	34	35	8.24
603	11	062	29	31	14.36
604	10	063	32	34	14.68
605	12	064	33	34	7.55
606	9	067	30	32	5.88
629	6	046	31	33	8.82
630	9	053	26	28	15.86
631	17	040	25	27	12.34
632	14	049	27	29	8.81
633	9	049	28	30	8.08
634	10	047	23	26	5.39
635	10	049	25	28	7.70
636	15	044	31	33	10.87
637	11	053	33	35	8.37
638	10	057	30	32	7.45
639	8	058	31	32	6.46
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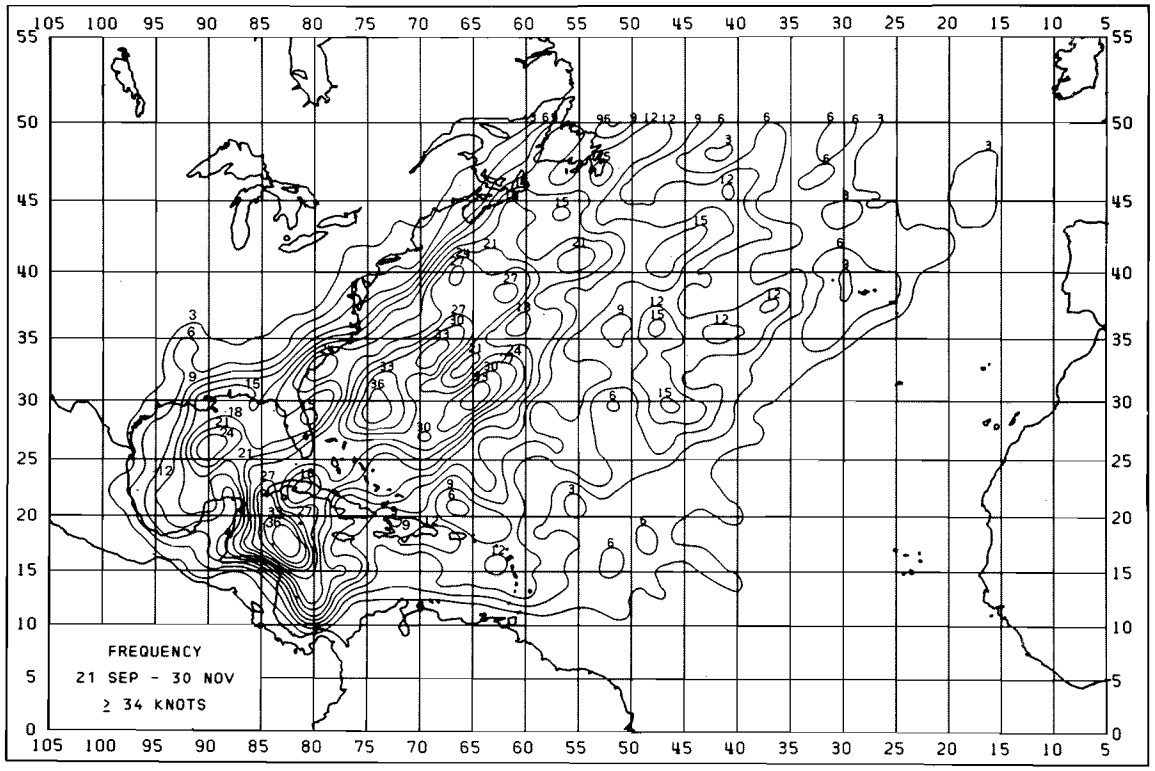
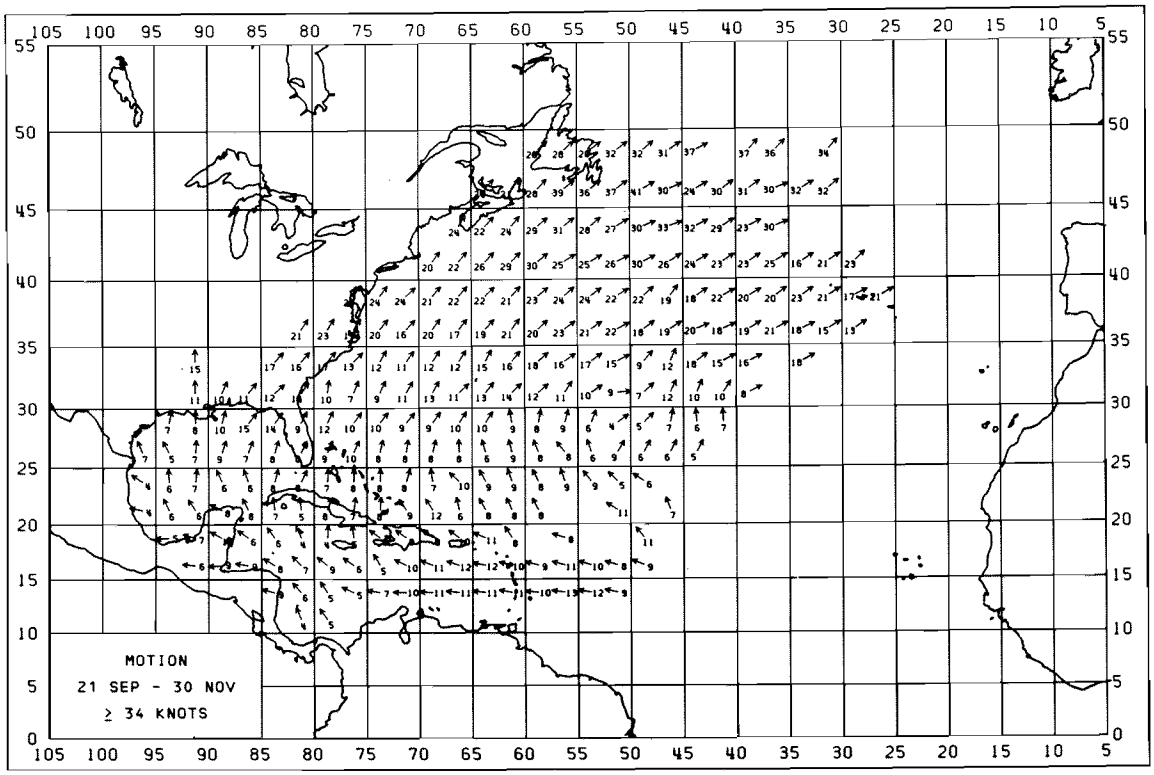

FREQUENCY
21 SEP - 30 NOV
≥ 34 KNOTS


MOTION
21 SEP - 30 NOV
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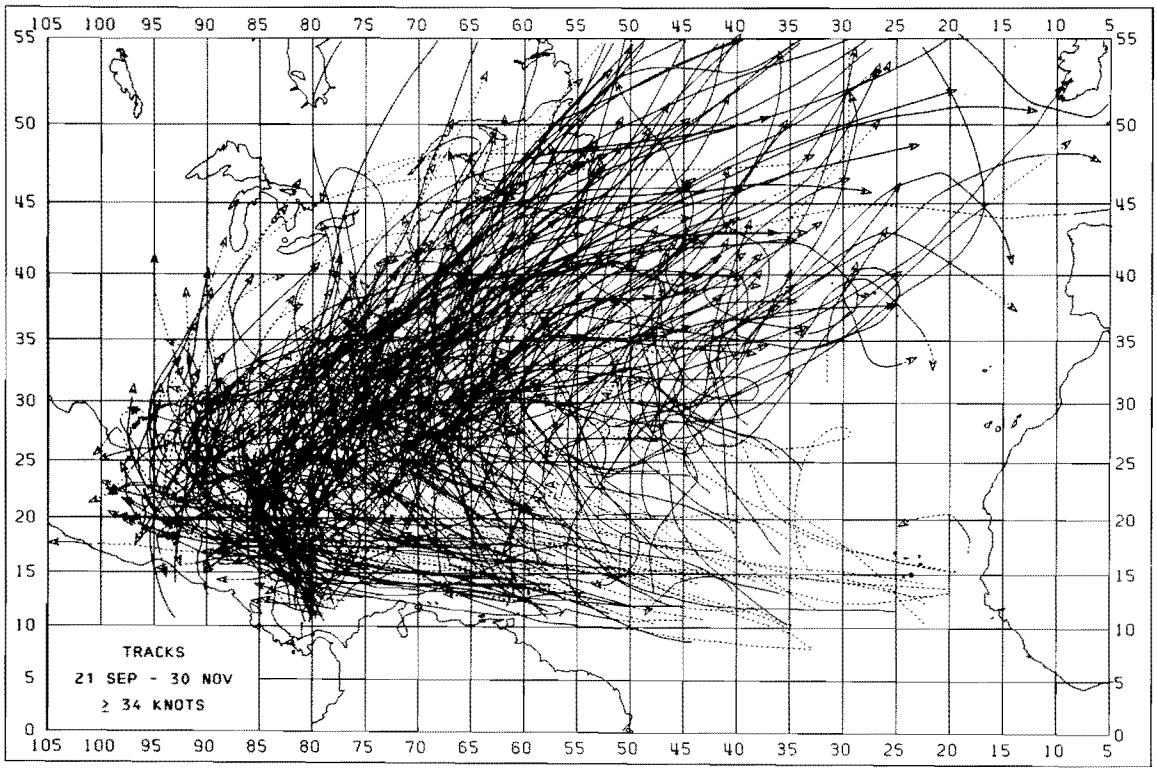

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83	12	325	5	6	4.01
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118	23	320	6	7	3.99
119	18	328	5	8	3.43
120	11	295	5	8	2.02
121	7	281	7	9	3.38
122	6	272	10	10	2.52
123	9	274	11	11	2.54
124	10	276	11	12	1.62
125	11	277	11	12	3.15
126	10	280	11	11	4.03
127	8	276	10	13	4.82
128	7	279	13	13	4.87
129	7	279	12	12	3.81
130	5	282	9	10	4.04
150	6	276	6	10	3.64
151	11	266	9	10	2.51
152	15	279	9	10	3.48
153	27	302	8	9	4.31
154	36	316	7	8	3.55
155	16	309	9	11	4.33
156	16	305	6	10	5.28
157	7	330	5	12	3.30
158	8	295	10	13	3.30
159	8	292	11	12	3.49
160	10	288	12	13	2.56
161	12	281	12	12	3.80
162	11	284	10	13	5.14
163	9	285	9	10	3.17
164	6	286	11	11	4.29
165	5	287	10	11	4.16
166	7	287	8	9	4.21
167	6	293	9	13	4.00
185	12	269	5	9	4.40
186	10	288	7	8	4.95
187	10	300	10	11	4.38
188	21	306	6	9	4.02
189	36	324	6	10	4.24
190	27	339	4	8	4.11
191	19	003	4	8	4.08
192	14	352	5	9	5.79
193	11	307	8	10	3.48
194	11	307	9	13	2.87
195	13	311	8	12	3.16
196	10	307	10	14	3.72
197	7	293	11	12	4.24
198	10	329	8	12	5.35
200	6	288	8	9	2.06
203	6	322	11	15	6.09
220	7	282	4	7	3.25
221	13	335	6	9	2.49
222	17	326	6	9	2.68

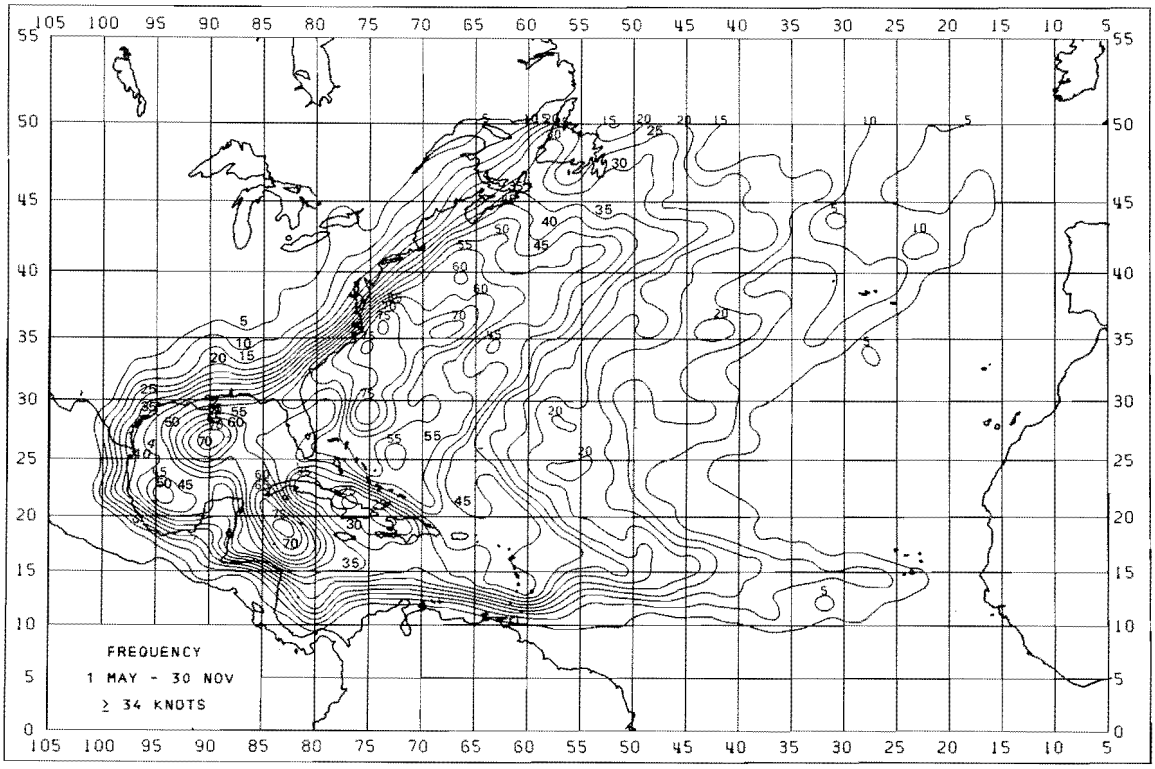
A	B	C	D	E	F
223	13	297	8	10	2.81
224	23	334	8	9	4.32
225	30	352	7	9	4.05
226	21	354	5	9	3.42
227	20	018	8	11	4.14
228	13	008	7	10	6.57
229	15	004	8	12	5.48
230	14	326	9	13	4.13
231	11	328	12	14	4.13
232	5	348	6	13	3.70
233	11	332	8	12	2.22
234	11	336	8	12	3.33
235	7	334	8	11	3.89
238	5	301	11	12	4.15
240	5	339	7	11	3.98
256	6	303	4	8	3.76
257	12	357	6	10	3.70
258	18	006	7	9	3.61
259	15	337	6	9	3.85
260	24	340	6	9	3.86
261	25	014	8	10	3.88
262	20	026	8	11	3.73
263	25	003	7	11	4.56
264	24	002	8	12	4.93
265	21	002	8	13	5.00
266	19	016	8	13	5.44
267	19	351	7	13	4.51
268	13	313	10	13	3.93
269	17	332	9	13	4.96
270	9	341	9	13	4.97
271	7	334	8	10	3.04
272	7	341	9	11	2.80
273	11	322	9	11	5.29
274	8	315	5	10	4.72
275	6	303	6	10	4.25
292	6	338	7	11	3.28
293	8	334	5	9	4.71
294	22	004	7	11	5.35
295	24	019	9	12	6.10
296	18	019	7	11	5.92
297	19	017	8	11	5.13
298	24	026	8	13	4.42
299	28	023	9	14	5.85
300	26	024	10	14	7.39
301	23	013	8	13	7.32
302	26	008	8	13	5.83
303	29	013	8	14	5.92
304	20	359	8	14	4.62
305	14	344	6	11	3.33
306	13	347	9	13	4.83
307	11	340	8	12	5.27
308	12	322	8	12	4.27
309	10	343	6	13	3.95

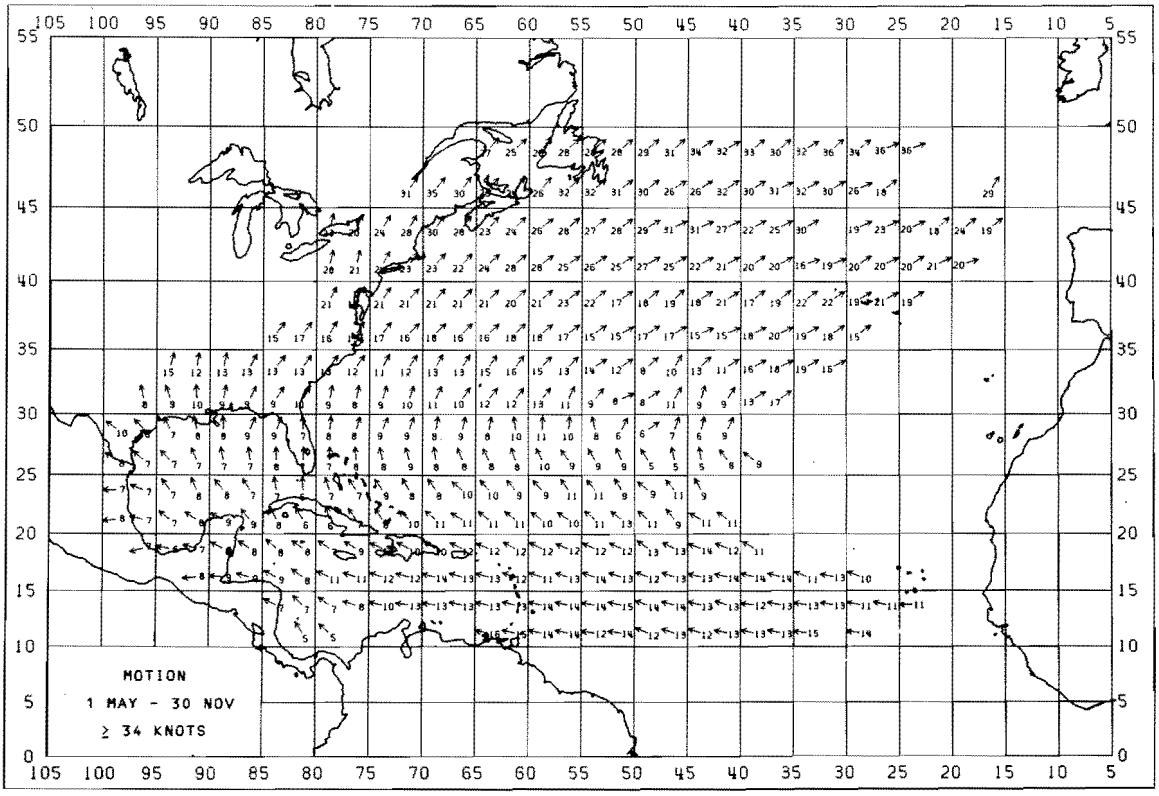
A	B	C	D	E	F
310	6	030	9	13	7.09
311	8	027	6	13	6.68
312	9	026	6	13	8.58
313	6	027	5	10	3.23
329	6	010	7	10	4.44
330	16	001	8	11	4.58
331	18	016	10	12	5.15
332	15	039	15	17	10.16
333	19	036	14	16	9.45
334	14	027	9	14	5.68
335	19	025	12	15	6.32
336	34	036	10	14	6.58
337	37	038	10	15	7.26
338	30	040	9	14	7.64
339	28	035	9	14	7.56
340	31	033	10	14	6.49
341	20	031	10	15	6.59
342	21	350	9	13	5.55
343	8	010	8	12	5.00
344	13	014	9	15	5.33
345	9	021	6	13	7.21
346	7	053	4	11	3.82
347	11	045	5	12	5.92
348	14	011	7	15	9.59
349	14	355	6	14	9.24
350	8	357	7	13	4.83
366	11	359	11	13	3.79
367	15	024	10	12	5.08
368	17	039	11	14	6.56
369	15	048	12	15	7.63
370	24	036	14	20	9.94
371	18	008	10	15	8.50
372	29	023	7	13	7.15
373	35	024	9	13	6.99
374	28	030	11	15	7.00
375	24	028	13	16	6.30
376	24	047	11	16	8.74
377	34	039	13	18	7.22
378	26	047	14	18	6.95
379	18	050	12	17	6.09
380	14	033	11	17	5.87
381	12	057	10	15	8.55
382	9	087	9	15	10.24
383	13	047	7	15	9.35
384	13	025	12	19	11.02
385	9	022	10	14	8.49
386	10	032	10	13	8.02
387	6	063	8	11	6.01
402	6	359	15	16	4.56
405	5	042	17	18	6.24
406	14	041	16	18	7.86
407	25	039	17	20	10.82
408	22	045	13	17	10.20

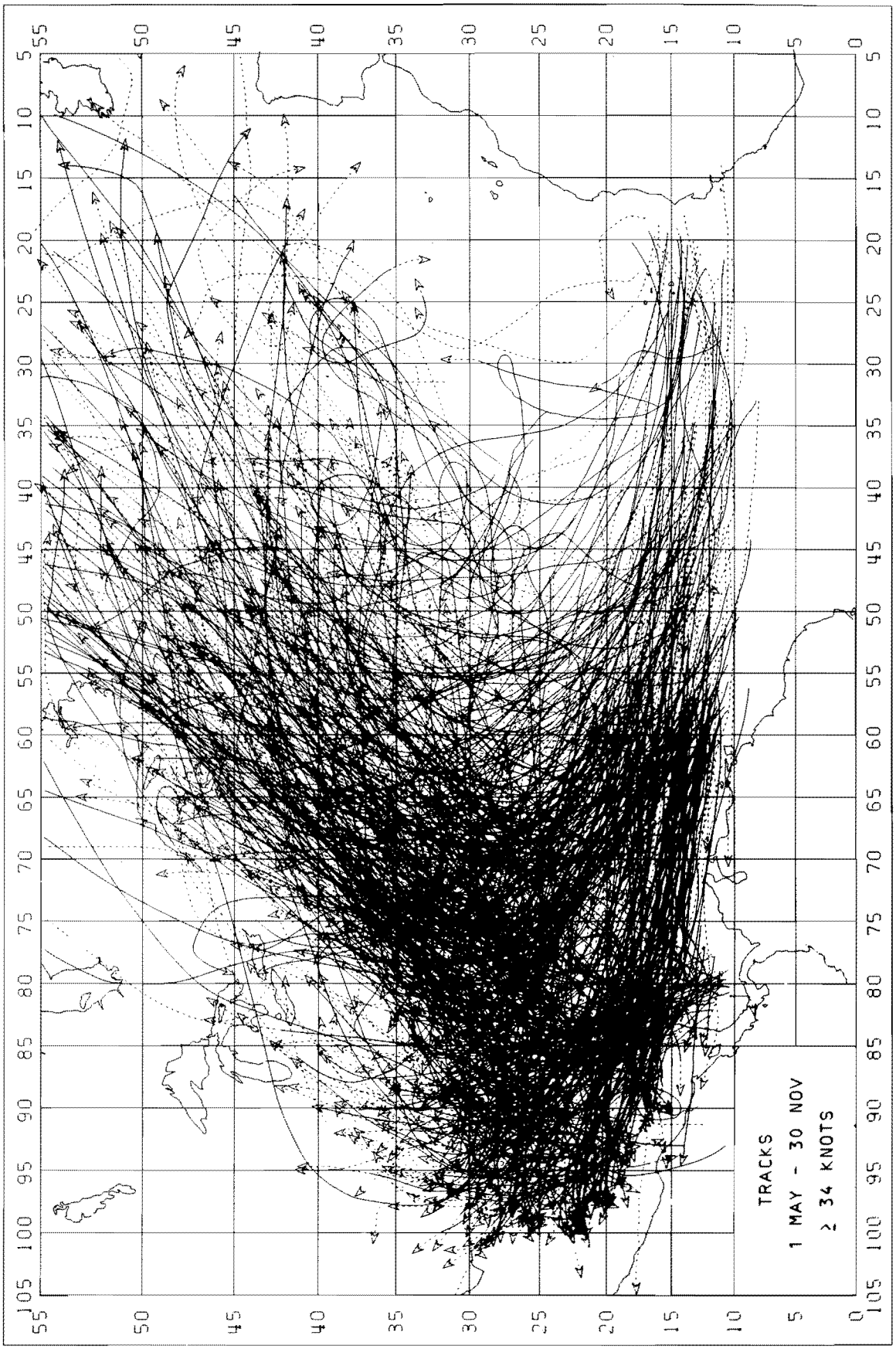
A	B	C	D	E	F
409	24	030	12	17	9.25
410	30	036	11	15	7.99
411	35	032	12	15	6.64
412	26	032	12	15	6.17
413	23	026	15	18	6.84
414	23	039	16	19	7.52
415	19	049	18	20	6.57
416	12	054	16	19	6.51
417	10	054	17	18	9.42
418	10	063	15	17	10.89
419	12	040	9	16	10.91
420	11	024	12	16	9.01
421	10	054	18	20	11.94
422	8	062	15	18	13.36
423	9	064	16	19	11.69
425	6	063	18	20	7.38
442	6	034	21	23	6.63
443	8	032	23	25	10.12
444	10	035	19	21	11.44
445	18	039	20	22	9.91
446	21	044	16	18	8.42
447	23	036	20	22	8.00
448	30	039	17	19	6.94
449	26	042	19	21	9.82
450	16	038	21	23	9.25
451	20	047	20	22	8.62
452	17	054	23	24	9.86
453	13	056	21	22	8.21
454	8	063	22	24	8.99
455	13	053	18	24	11.69
456	12	058	19	22	12.06
457	11	068	20	21	11.05
458	12	066	18	19	11.44
459	11	058	19	21	10.38
460	8	062	21	22	7.21
461	6	065	18	22	9.03
462	8	058	15	18	9.19
463	6	056	13	18	8.38
480	7	032	21	25	11.64
481	9	037	24	28	13.67
482	12	047	24	25	11.85
483	27	040	21	23	8.98
484	23	041	22	24	10.63
485	26	046	22	25	10.56
486	27	043	21	23	10.12
487	19	051	23	23	11.74
488	15	049	24	24	10.14
489	16	054	24	26	11.53
490	12	058	22	23	12.22
491	12	048	22	24	10.39
492	12	037	19	22	12.53
493	9	057	18	19	12.87
494	8	061	22	23	12.75

A	B	C	D	E	F
495	6	059	20	21	7.85
496	9	053	20	21	8.55
497	5	054	23	23	10.48
498	7	058	21	23	9.40
499	9	064	17	21	9.51
500	8	060	21	23	9.63
519	12	036	20	23	10.34
520	23	039	22	24	10.20
521	22	044	26	28	11.39
522	20	045	29	30	12.12
523	17	052	30	32	13.13
524	21	058	25	27	13.04
525	22	060	25	27	11.53
526	17	065	26	27	13.07
527	13	063	30	32	13.80
528	15	057	26	28	11.76
529	12	060	24	26	12.31
530	9	058	23	25	13.93
531	7	056	23	26	16.46
532	5	056	25	27	18.87
533	5	057	16	17	11.92
534	6	056	21	22	10.76
535	7	045	23	27	11.53
556	8	032	24	25	12.62
557	15	043	22	23	8.98
558	20	040	24	25	10.56
559	17	049	29	30	13.19
560	15	051	31	34	17.73
561	13	049	28	31	10.84
562	12	058	27	30	10.48
563	10	069	30	32	12.31
564	12	071	33	35	13.34
565	12	063	32	34	12.00
566	13	059	29	32	14.13
567	10	064	23	26	14.89
568	6	069	30	32	16.58
593	7	042	24	26	6.98
594	12	041	21	22	7.07
595	14	043	28	29	9.99
596	12	052	39	41	19.79
597	14	052	36	39	19.76
598	12	054	37	41	20.22
599	7	059	41	45	25.48
600	9	067	30	33	25.50
601	9	061	24	26	8.99
602	12	054	30	32	10.92
603	9	054	31	33	11.66
604	6	070	30	31	12.55
605	7	059	32	35	13.22
606	6	050	32	36	11.85
631	10	048	26	27	6.90
632	13	049	28	30	7.31
633	10	052	28	30	8.78

A	B	C	D	E	F
634	12	053	32	35	9.16
635	15	050	32	35	11.31
636	12	055	31	34	13.82
637	6	063	37	39	10.74
639	5	041	37	38	8.82
640	6	045	36	37	8.30
642	8	042	34	37	18.86


FREQUENCY
1 MAY - 30 NOV
≥ 34 KNOTS


MOTION
1 MAY - 30 NOV
≥ 34 KNOTS



See next page for tabular data.

A	B	C	D	E	F
82	18	327	5	6	4.05
83	16	313	5	8	4.66
89	9	281	16	16	4.61
90	16	282	15	15	4.66
91	17	281	14	14	5.09
92	12	281	14	14	5.59
93	7	278	12	13	5.17
94	8	278	14	14	5.46
95	5	293	12	13	4.07
96	7	288	13	14	2.87
97	6	288	12	12	3.52
98	8	282	13	13	3.97
99	10	281	13	14	3.83
100	11	282	13	13	4.29
101	7	276	15	15	4.56
103	7	276	14	15	4.85
117	15	297	7	9	3.50
118	35	314	7	8	4.00
119	29	306	7	9	4.12
120	25	286	8	11	4.23
121	25	283	10	12	4.42
122	25	279	13	13	4.77
123	31	279	13	14	4.34
124	37	282	13	13	4.21
125	46	282	13	13	3.80
126	47	284	13	13	4.16
127	40	283	14	15	5.43
128	26	281	14	14	4.23
129	25	280	14	15	4.46
130	29	282	15	16	4.89
131	27	288	14	15	4.35
132	23	284	14	14	4.28
133	20	286	13	14	3.46
134	18	287	13	13	3.55
135	11	276	12	13	4.15
136	10	282	13	14	2.34
137	9	279	13	14	3.55
138	9	280	13	13	4.45
139	10	281	11	12	4.54
140	9	282	11	12	3.62
141	8	270	11	12	4.67
150	10	264	8	11	3.97
151	25	276	9	10	3.66
152	35	285	9	10	3.88
153	53	298	9	10	4.09
154	62	305	8	10	4.10
155	45	294	11	12	4.92
156	42	287	11	13	5.56
157	36	287	12	15	4.75
158	38	284	12	14	4.55
159	38	282	14	14	4.92
160	43	285	13	14	4.35
161	44	285	13	13	4.05

A	B	C	D	E	F
162	43	288	12	13	4.46
163	43	288	11	12	4.16
164	42	288	13	13	5.73
165	37	288	14	14	5.68
166	32	287	13	13	5.59
167	30	290	12	13	4.30
168	25	288	13	13	4.05
169	24	283	13	14	4.46
170	17	282	14	15	6.19
171	15	284	14	14	6.77
172	9	284	14	15	4.31
173	10	291	11	13	4.37
174	5	281	13	14	4.30
175	7	291	10	11	4.22
184	8	254	7	10	2.35
185	23	279	6	8	3.87
186	24	285	7	9	4.08
187	29	296	9	10	3.64
188	48	303	8	10	3.58
189	72	311	8	10	3.97
190	67	304	8	10	4.19
191	43	304	7	11	5.05
192	34	299	9	12	5.31
193	30	294	10	12	3.63
194	28	296	10	13	2.71
195	44	300	10	12	3.36
196	48	296	12	13	3.27
197	50	292	12	13	3.54
198	50	298	12	13	4.41
199	44	296	12	12	4.28
200	34	290	12	12	3.28
201	25	293	12	13	3.87
202	22	294	12	13	4.87
203	25	305	13	14	5.08
204	14	294	13	14	6.75
205	8	290	14	15	5.23
206	7	292	12	13	3.85
207	5	300	11	12	3.32
219	18	264	8	9	4.49
220	35	283	7	9	3.70
221	52	308	7	9	3.45
222	45	303	8	10	3.36
223	38	297	9	11	3.06
224	59	319	9	10	3.76
225	66	333	8	10	3.81
226	38	328	6	9	3.54
227	30	346	6	11	3.58
228	25	325	7	10	5.40
229	32	325	8	11	4.44
230	48	312	10	12	4.24
231	55	310	11	13	4.47
232	43	301	11	12	4.59
233	45	308	11	13	4.36

A	B	C	D	E	F
234	47	308	11	12	4.16
235	35	305	10	11	4.35
236	25	304	10	11	3.63
237	24	310	11	13	4.78
238	19	308	13	14	5.04
239	14	310	11	12	3.84
240	10	322	9	13	4.62
241	7	300	11	14	3.62
242	7	306	11	12	2.77
255	20	269	7	9	3.49
256	40	291	7	9	2.74
257	43	324	7	10	4.06
258	47	336	8	10	4.23
259	47	321	8	10	3.87
260	59	328	7	9	3.46
261	50	350	7	10	3.52
262	38	359	6	11	3.43
263	44	341	7	10	4.00
264	52	327	7	11	4.34
265	60	324	9	12	4.35
266	57	330	8	12	4.55
267	52	326	8	12	4.46
268	42	309	10	11	4.54
269	45	319	10	12	4.38
270	32	319	9	11	4.20
271	22	317	9	11	4.43
272	18	325	11	12	3.05
273	21	322	11	13	5.78
274	17	328	9	13	5.19
275	10	307	9	12	4.54
276	9	319	11	13	4.34
277	6	332	9	11	4.37
291	21	302	8	9	3.41
292	41	312	7	9	3.66
293	47	314	7	10	3.87
294	68	336	7	10	4.29
295	65	348	7	11	4.76
296	50	354	7	10	5.56
297	50	357	8	11	5.21
298	51	002	7	12	4.03
299	60	000	7	12	5.52
300	63	355	8	12	6.29
301	56	346	8	12	5.73
302	57	345	9	12	5.57
303	56	352	8	12	5.37
304	46	339	8	11	4.74
305	36	334	8	11	3.93
306	28	341	8	12	4.34
307	26	335	10	13	5.10
308	23	324	9	12	4.24
309	20	329	9	13	5.57
310	17	336	9	13	5.26
311	13	327	5	13	5.78

A	B	C	D	E	F
312	13	347	5	13	7.29
313	10	351	5	12	4.02
314	8	322	8	15	3.77
315	7	306	9	12	4.73
327	16	306	10	11	3.84
328	32	318	8	11	4.46
329	44	333	7	9	3.98
330	54	347	8	10	4.41
331	56	357	8	12	4.35
332	55	021	9	13	7.45
333	54	021	9	13	7.37
334	47	356	7	12	5.27
335	45	005	8	12	5.74
336	77	015	8	12	5.91
337	73	021	9	13	6.71
338	60	019	9	13	6.67
339	60	009	8	13	6.06
340	57	013	9	13	5.95
341	40	010	8	14	5.73
342	34	353	10	13	5.24
343	21	003	11	14	6.78
344	22	004	10	15	6.47
345	21	347	8	12	5.40
346	15	025	6	11	4.00
347	13	056	6	12	5.41
348	16	019	7	15	8.78
349	16	014	6	15	9.01
350	13	024	9	15	5.07
364	19	347	8	9	3.85
365	18	340	9	11	4.85
366	30	356	10	13	3.87
367	36	011	9	12	4.99
368	39	026	9	12	6.31
369	46	031	9	14	7.14
370	57	029	11	16	8.36
371	57	010	9	13	7.14
372	67	011	8	12	6.34
373	70	017	9	12	5.97
374	62	019	10	14	6.55
375	56	024	11	14	6.78
376	52	034	10	14	7.67
377	54	039	12	16	6.80
378	42	038	12	16	7.38
379	29	038	13	17	6.69
380	26	024	11	16	6.02
381	22	039	9	14	7.22
382	16	068	8	14	9.21
383	15	055	8	15	8.58
384	17	031	11	17	10.15
385	12	015	9	13	8.15
386	11	033	9	12	8.35
387	10	060	13	15	7.37
388	7	054	17	17	5.02

A	B	C	D	E	F
401	7	016	15	16	9.13
402	14	008	12	13	5.45
403	16	013	13	15	7.86
404	14	029	13	15	8.06
405	15	039	13	14	7.67
406	35	037	13	15	8.06
407	61	037	13	17	9.18
408	74	037	12	15	8.16
409	71	029	11	15	8.06
410	67	034	12	16	8.21
411	61	030	13	15	6.71
412	54	032	13	15	6.39
413	46	035	15	18	7.08
414	45	038	16	18	7.26
415	36	044	15	17	7.42
416	33	046	13	16	6.15
417	22	058	14	16	7.92
418	19	056	12	15	9.21
419	18	048	8	14	9.51
420	18	032	10	14	7.96
421	15	046	13	15	11.46
422	11	059	11	16	12.05
423	9	064	16	19	11.68
424	7	066	18	20	8.85
425	9	063	19	21	8.68
426	7	065	16	17	8.85
441	6	036	15	17	6.51
442	11	038	17	19	7.21
443	21	031	16	19	8.79
444	47	035	15	18	8.80
445	76	038	17	19	8.10
446	64	046	16	18	8.25
447	71	046	18	20	8.98
448	73	044	16	18	8.13
449	61	048	16	18	8.97
450	49	046	18	19	9.39
451	52	051	18	20	8.83
452	43	053	17	19	8.58
453	33	055	15	18	8.10
454	26	063	15	19	8.74
455	27	057	17	21	10.26
456	22	062	17	20	10.77
457	21	069	15	17	9.77
458	21	068	15	17	9.93
459	16	065	18	19	8.80
460	9	065	20	21	6.62
461	9	063	19	22	7.91
462	11	057	18	20	9.45
463	8	055	15	18	9.02
479	9	029	21	23	10.97
480	22	032	19	22	8.57
481	40	033	21	23	9.93
482	56	043	21	23	9.39

A	B	C	D	E	F
483	60	042	21	23	9.35
484	59	044	21	23	10.86
485	56	047	21	23	10.66
486	55	049	20	22	9.33
487	52	051	21	23	10.36
488	46	053	23	24	9.65
489	41	053	22	23	9.97
490	29	055	17	19	10.12
491	22	052	18	21	9.13
492	21	047	19	22	11.07
493	18	057	18	19	11.35
494	15	058	21	22	10.68
495	9	053	17	19	7.70
496	10	051	19	21	8.44
497	6	054	22	23	10.52
498	9	058	22	24	8.79
499	12	061	19	22	10.46
500	13	063	21	24	10.24
501	7	058	19	22	11.51
515	6	013	28	31	16.54
516	10	014	21	23	12.21
517	19	028	24	26	11.25
518	31	037	23	24	10.86
519	46	041	23	24	10.37
520	59	044	22	24	9.09
521	54	048	24	26	11.40
522	46	050	28	30	11.72
523	46	054	28	29	11.85
524	48	057	25	27	10.81
525	51	057	26	28	10.52
526	45	059	25	27	11.21
527	35	062	27	29	11.08
528	27	060	25	27	9.87
529	22	064	22	24	11.01
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531	20	057	20	22	11.02
532	12	063	20	23	12.85
533	11	073	16	19	9.64
534	11	071	19	21	10.55
535	10	058	20	25	10.66
536	10	065	20	23	12.57
537	10	058	20	24	11.15
538	9	066	21	26	10.93
539	6	074	20	26	10.64
551	6	014	23	29	16.02
552	5	025	20	24	16.50
553	7	032	24	25	12.36
554	14	030	28	29	10.83
555	21	034	30	31	14.39
556	32	036	28	29	11.87
557	44	044	23	24	9.10
558	46	045	24	25	9.54
559	38	053	26	28	11.11

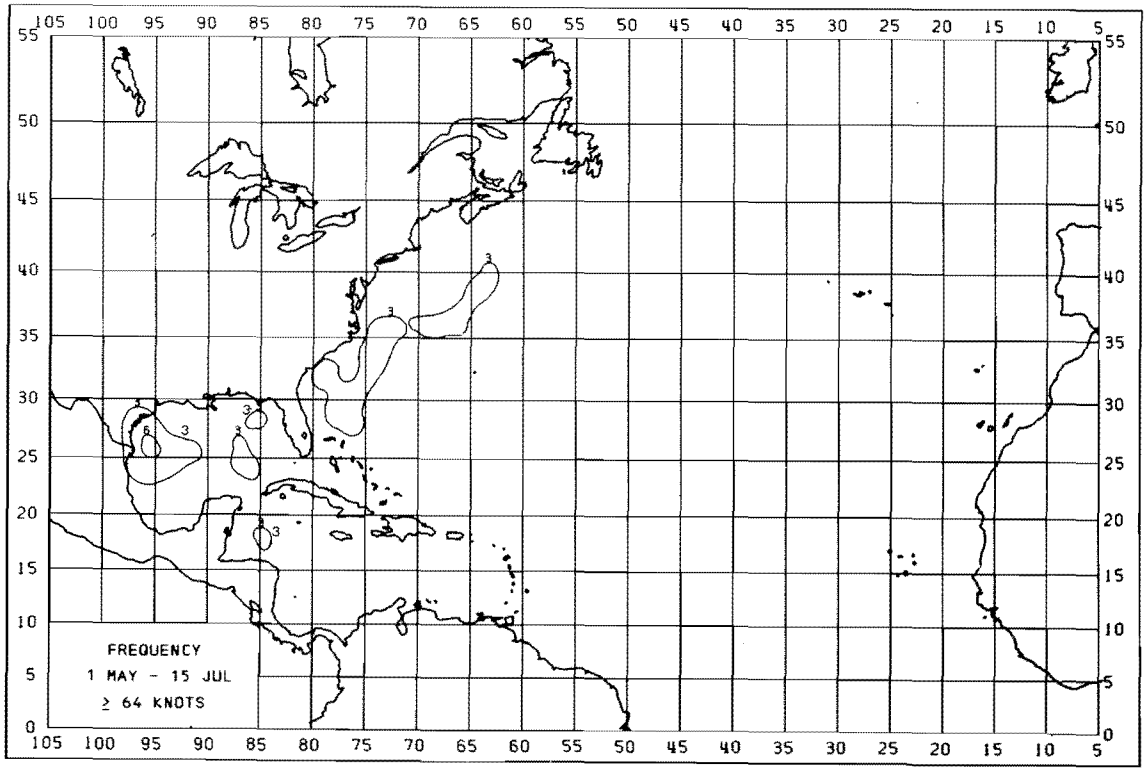
A	B	C	D	E	F
560	40	050	28	31	12.43
561	36	051	27	29	8.97
562	38	054	28	30	9.88
563	31	060	29	31	11.28
564	31	065	31	33	10.53
565	29	066	31	32	10.66
566	26	066	27	29	12.48
567	25	063	22	25	12.24
568	20	064	25	27	12.66
569	12	060	30	32	12.05
571	7	067	19	27	13.12
572	8	065	23	29	12.88
573	7	068	20	28	10.30
574	7	048	18	25	12.16
575	6	052	24	27	12.05
576	5	052	19	25	14.93
590	6	034	31	34	7.18
591	10	039	35	37	12.14
592	20	035	30	32	11.80
593	25	042	26	28	12.62
594	32	039	24	26	9.72
595	31	039	26	28	8.87
596	25	049	32	35	15.80
597	29	052	32	34	15.56
598	32	054	31	33	14.19
599	31	053	30	33	15.02
600	25	057	26	29	17.01
601	20	057	26	28	9.30
602	23	056	32	34	9.55
603	20	058	30	32	12.82
604	16	066	31	33	13.52
605	19	062	32	35	9.45
606	15	060	30	34	8.36
607	7	067	26	28	10.39
608	5	051	18	25	16.25
612	6	032	29	33	12.05
629	9	042	27	28	10.24
630	16	050	25	26	13.10
631	29	041	26	28	10.25
632	28	048	28	29	7.87
633	20	050	28	30	7.84
634	23	051	28	31	8.53
635	26	050	29	32	10.34
636	27	049	31	34	11.92
637	17	057	34	36	9.09
638	13	062	32	34	9.27
639	13	051	33	35	7.64
640	14	050	30	31	10.81
641	9	060	32	33	16.64
642	15	049	36	39	15.33
643	11	052	34	36	12.99
644	6	068	36	36	5.94
645	6	070	36	36	4.26

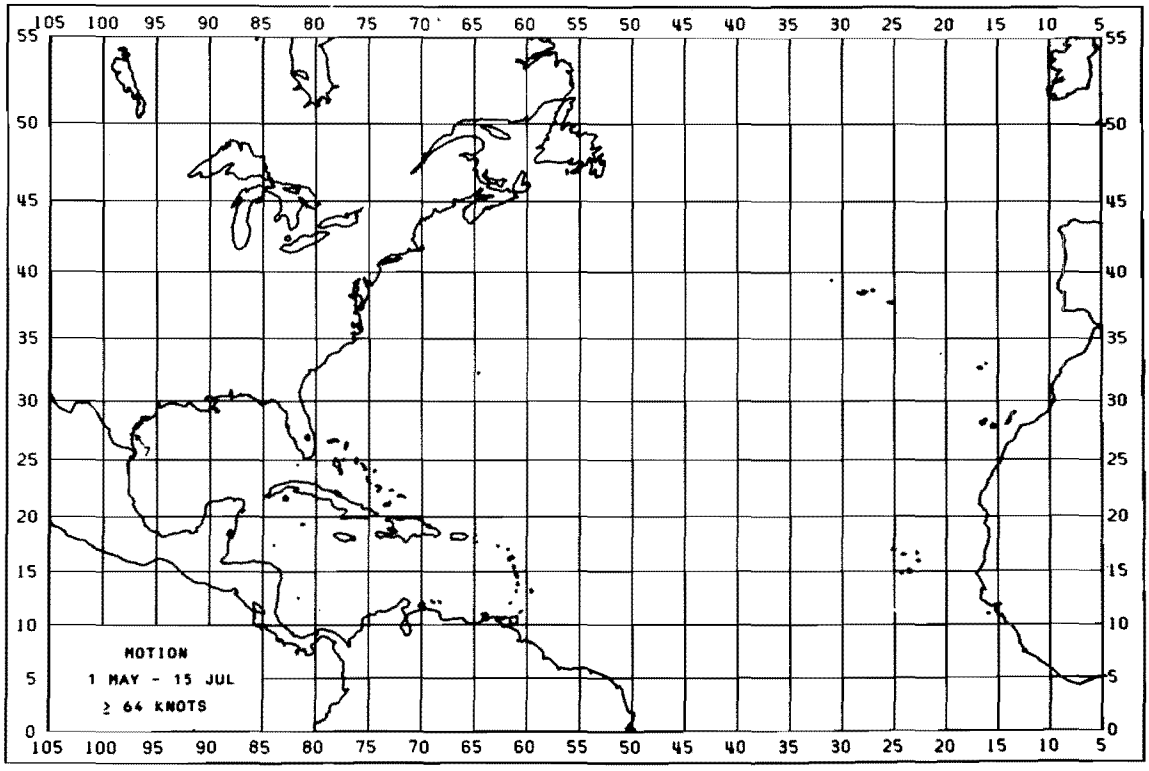
TABULAR DATA
1 MAY - 30 NOV
≥ 34 KNOTS

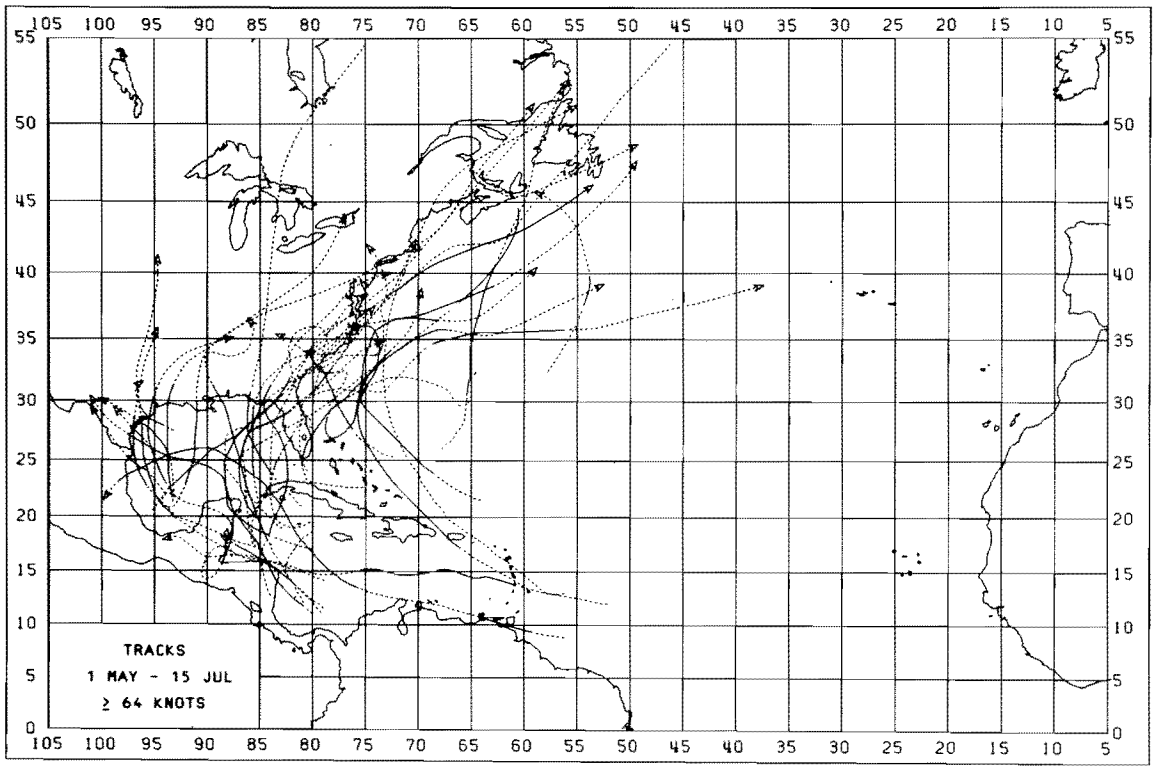
A.4 Chart Series B

Charts and tabular data in this series are based on portions of storm tracks having intensities of at least 64 knots and for the following periods:

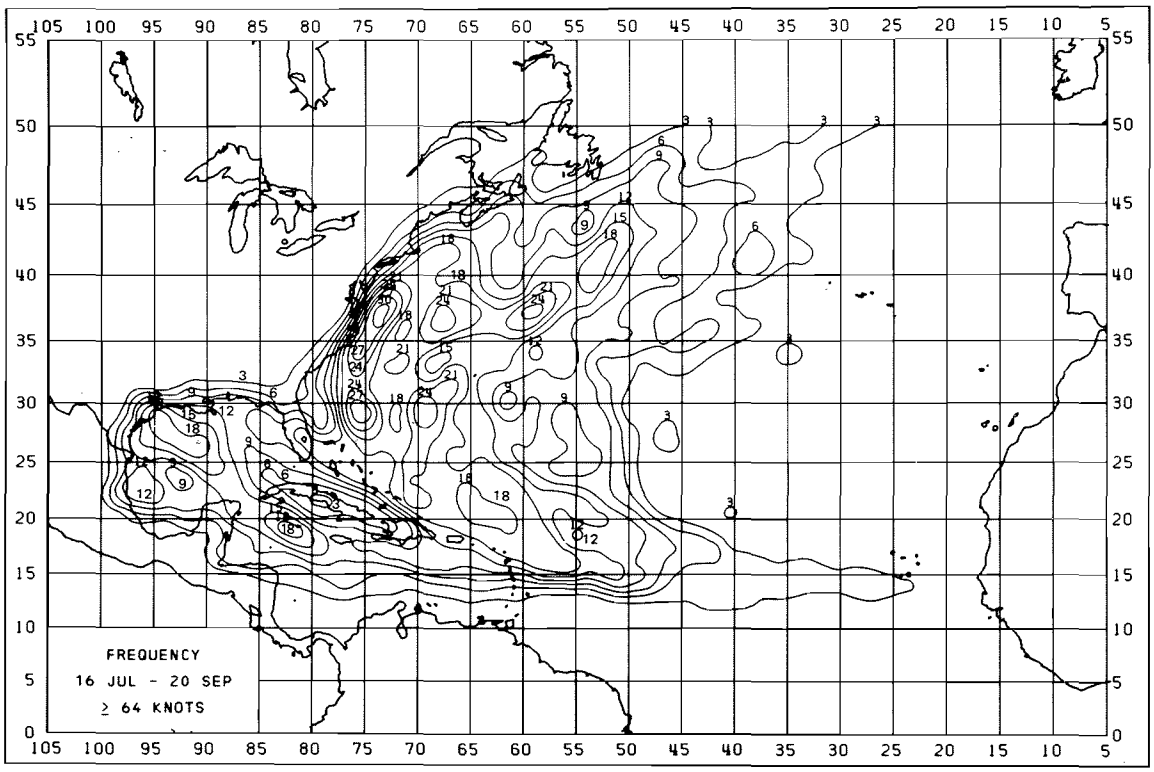
STRATIFICATION PERIOD	PAGES
1 May - 15 Jul	A-46,47
16 Jul - 20 Sep	A-48,49
21 Sep - 30 Nov	A-50,51
1 May - 30 Nov	A-52,53


FREQUENCY
1 MAY - 15 JUL
≥ 64 KNOTS


MOTION
1 MAY - 15 JUL
≥ 64 KNOTS



A B C D E F
292 5 323 7 8 3.80


FREQUENCY
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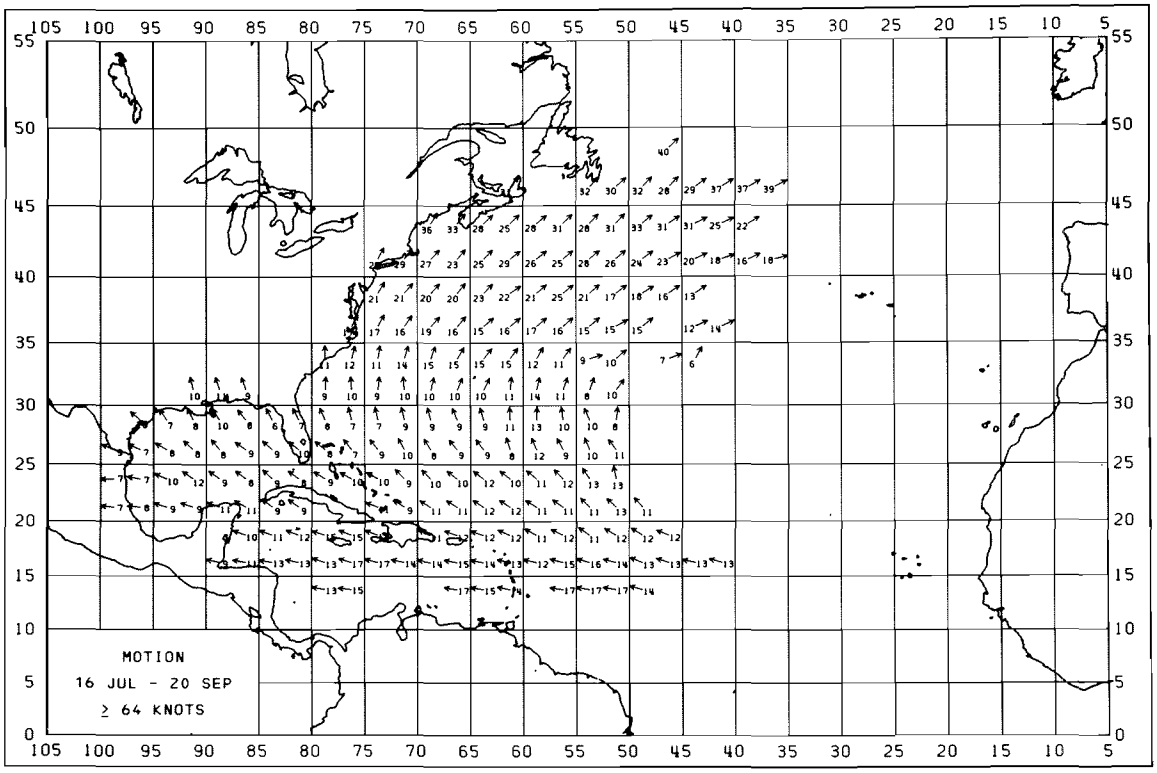
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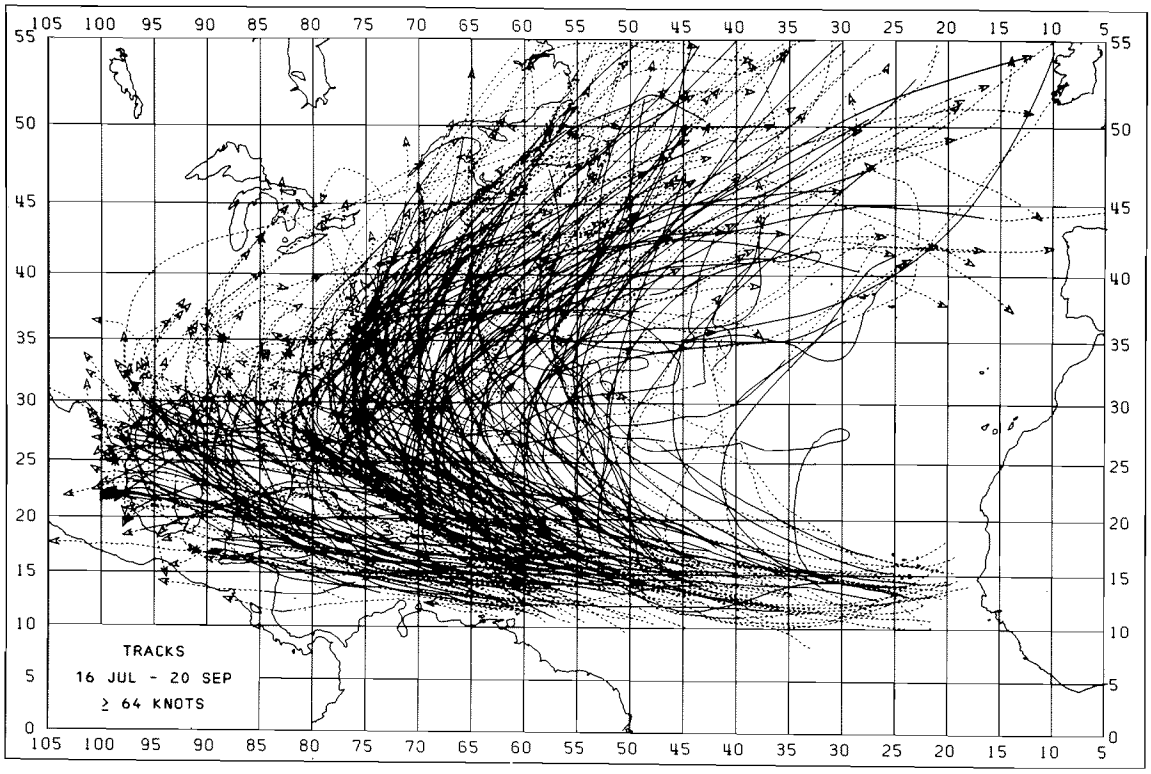

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124	6	280	17	18	3.97
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126	5	282	14	14	2.12
128	6	278	17	17	5.25
129	7	280	17	17	5.03
130	12	280	17	17	4.22
131	9	286	14	15	4.00
151	6	283	9	9	4.35
152	8	281	11	12	5.09
153	7	280	13	14	4.55
154	7	282	13	13	5.31
155	10	289	13	13	5.44
156	9	286	17	17	4.32
157	10	285	17	17	4.82
158	13	282	14	15	3.91
159	15	280	14	15	3.84
160	13	282	15	15	4.36
161	15	281	14	14	4.46
162	17	283	13	13	4.26
163	19	284	12	13	4.01
164	21	286	15	15	5.55
165	17	287	16	16	5.88
166	14	285	14	15	5.99
167	10	292	13	14	5.52
168	8	288	13	14	5.07
169	6	282	13	13	3.06
170	6	286	13	13	3.24
188	10	290	10	11	3.89
189	15	290	11	11	3.89
190	21	291	12	13	4.21
191	11	289	15	15	4.03
192	11	291	15	15	3.58
193	8	290	13	13	3.54
195	16	291	11	12	3.01
196	18	290	12	13	3.08
197	20	289	12	12	3.47
198	19	294	12	12	3.39
199	21	300	11	12	3.43
200	15	297	12	12	2.88
201	14	307	11	12	3.77
202	13	301	12	12	3.92
203	13	303	12	12	3.96
204	9	292	12	13	7.04
219	5	277	7	8	3.38
220	10	276	8	9	3.73
221	10	288	9	9	2.76
222	10	288	9	10	3.16
223	12	291	11	12	2.55
224	14	299	11	12	3.18
225	12	307	9	10	3.70
226	6	306	9	11	4.39
229	8	291	11	11	3.19
230	19	302	9	10	3.51
231	21	303	11	12	4.47
232	20	303	11	12	5.13
233	18	304	12	12	4.12
234	18	304	12	12	4.26
235	18	303	11	12	4.85
236	16	306	11	12	3.61
237	16	316	11	13	4.98
238	11	314	13	14	5.77
239	6	319	11	12	3.26
255	5	268	7	8	3.56
256	13	280	7	8	2.22
257	9	293	10	11	5.98
258	10	305	12	13	4.69
259	14	306	9	10	3.72
260	10	306	8	9	2.31
261	5	313	9	9	2.96
262	8	307	8	9	2.87
263	11	302	9	9	3.23
264	16	299	10	10	3.46
265	16	299	10	11	3.09
266	21	316	9	10	3.31
267	20	316	10	11	4.39
268	19	308	10	11	4.39
269	20	307	12	12	4.23
270	19	308	10	10	3.71
271	12	310	11	12	4.90
272	9	316	12	13	3.31
273	9	326	13	15	5.71
274	8	348	13	14	5.69
291	5	294	9	10	3.14
292	15	296	7	10	3.77
293	16	301	8	10	4.11
294	19	314	8	9	3.58
295	14	322	8	10	3.21
296	8	306	9	10	3.92
297	12	313	9	10	3.05
298	14	310	10	11	2.67
299	18	310	8	10	2.70
300	16	323	7	9	4.27
301	20	322	9	10	3.50
302	21	332	10	11	3.59
303	21	330	8	10	4.02
304	18	321	9	10	4.30
305	16	324	9	10	4.75
306	11	343	8	11	3.62
307	12	338	12	14	5.36
308	10	334	9	13	4.06
309	7	338	10	11	3.88
310	8	325	11	12	2.94
328	15	311	8	10	4.21
329	20	326	7	9	4.54
330	14	335	8	10	4.58
331	12	328	10	11	4.93
332	13	322	8	9	5.02
333	12	332	6	8	2.73
334	14	334	7	9	3.54
335	8	337	8	9	3.09
336	27	346	7	9	4.41
337	23	347	7	11	4.38
338	20	347	9	12	4.22
339	27	346	9	12	4.17
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344	8	352	10	14	8.08
345	10	337	10	12	3.79
346	6	006	8	11	4.65
366	7	347	10	13	4.23
367	6	342	11	12	3.58
368	5	341	9	9	4.16
371	13	003	9	11	5.51
372	23	356	10	11	3.99
373	20	006	9	11	5.06
374	21	354	10	12	5.94
375	21	013	10	13	6.64
376	22	021	10	12	5.79
377	14	025	10	12	5.12
378	10	005	11	15	8.89
379	10	013	14	16	8.20
380	10	019	11	14	7.02
381	10	019	8	12	5.50
382	5	037	10	14	8.37
407	9	359	11	13	5.96
408	27	015	12	13	5.87
409	21	009	11	14	4.66
410	21	017	14	16	7.10
411	16	019	15	17	7.51
412	17	030	15	16	7.28
413	17	038	15	18	7.28
414	15	036	15	17	7.46
415	12	030	12	14	8.49
416	16	036	11	14	5.82
417	8	074	9	12	4.02
418	6	050	10	14	6.58
420	6	070	7	10	5.34
421	5	028	6	8	4.87
444	15	029	17	18	9.98
445	30	029	17	19	7.30
446	16	036	16	19	8.44
447	25	042	19	20	7.41
448	25	040	16	18	7.14
449	20	049	15	17	8.26
450	22	051	16	18	9.57
451	21	050	17	18	9.62
452	13	049	16	17	6.17
453	10	049	15	18	5.50
454	9	061	15	19	7.56
455	8	052	15	19	7.94
457	7	066	12	14	7.42
458	6	066	14	16	6.54
481	21	030	21	23	9.22
482	23	040	21	22	9.13
483	19	041	20	23	9.96
484	21	038	20	23	9.66
485	15	043	23	25	9.55
486	13	055	22	23	9.74
487	20	049	21	23	10.84
488	18	051	25	25	10.42
489	17	049	21	22	9.29
490	13	053	17	19	8.23
491	9	058	18	20	6.37
492	7	055	16	17	5.28
493	5	056	13	14	4.05
517	5	028	28	30	10.70
518	14	037	29	30	10.27
519	18	042	27	27	11.67
520	18	039	23	25	7.22
521	14	044	25	27	9.72
522	10	051	29	31	10.79
523	13	051	26	28	12.37
524	15	050	25	26	11.14
525	18	050	28	29	11.47
526	17	048	26	28	10.56
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528	8	062	23	24	7.14
529	7	065	20	21	10.02
530	5	072	18	19	9.86
531	9	065	16	19	6.65
532	5	076	18	20	8.33
555	7	031	36	37	13.57
556	9	038	33	34	11.37
557	12	047	28	29	10.99
558	12	046	25	26	10.60
559	9	050	28	30	11.14
560	11	045	31	33	8.79
561	7	043	28	30	11.30
562	15	042	31	32	10.83
563	11	050	33	34	10.94
564	11	056	31	33	9.86
565	9	064	31	32	11.04
566	5	065	25	27	9.19
567	5	058	22	24	7.66
594	8	039	31	31	13.51
597	6	043	32	34	6.74
598	9	048	30	32	7.63
599	10	044	32	34	9.30
600	7	044	28	30	10.80
601	6	055	29	31	10.03
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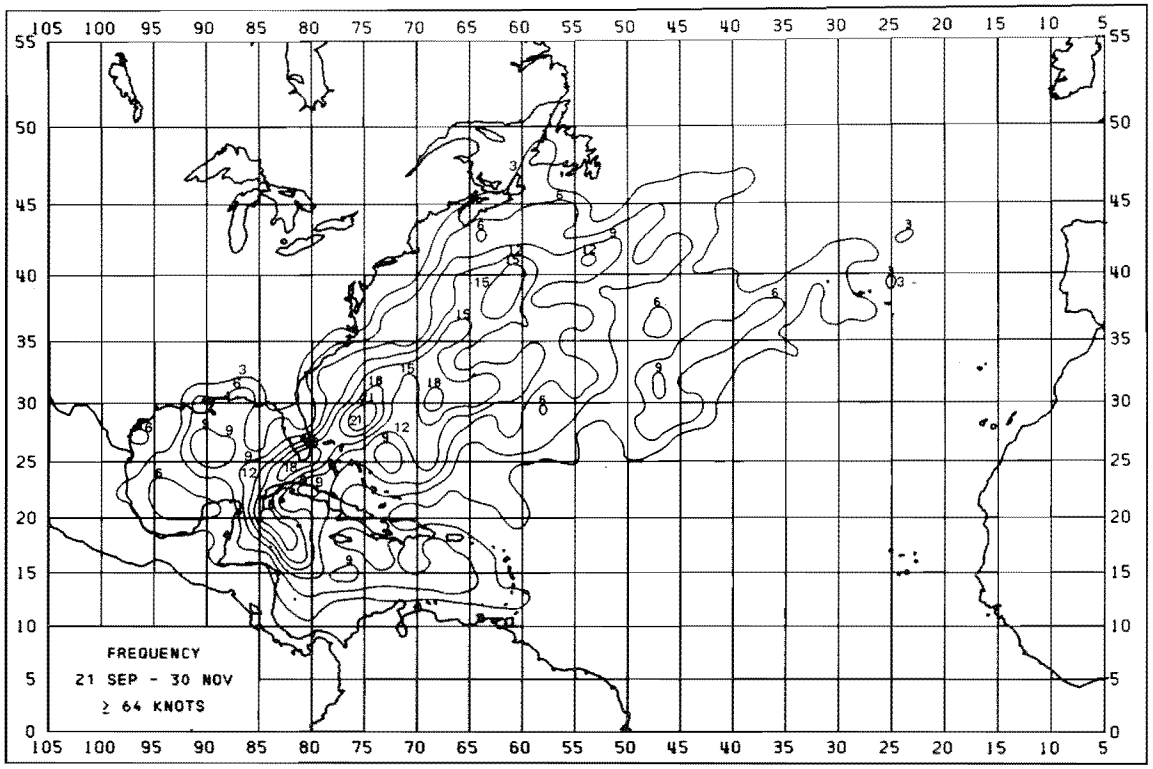
604	5	063	39	40	13.43
636	5	046	40	43	3.59


FREQUENCY
21 SEP - 30 NOV
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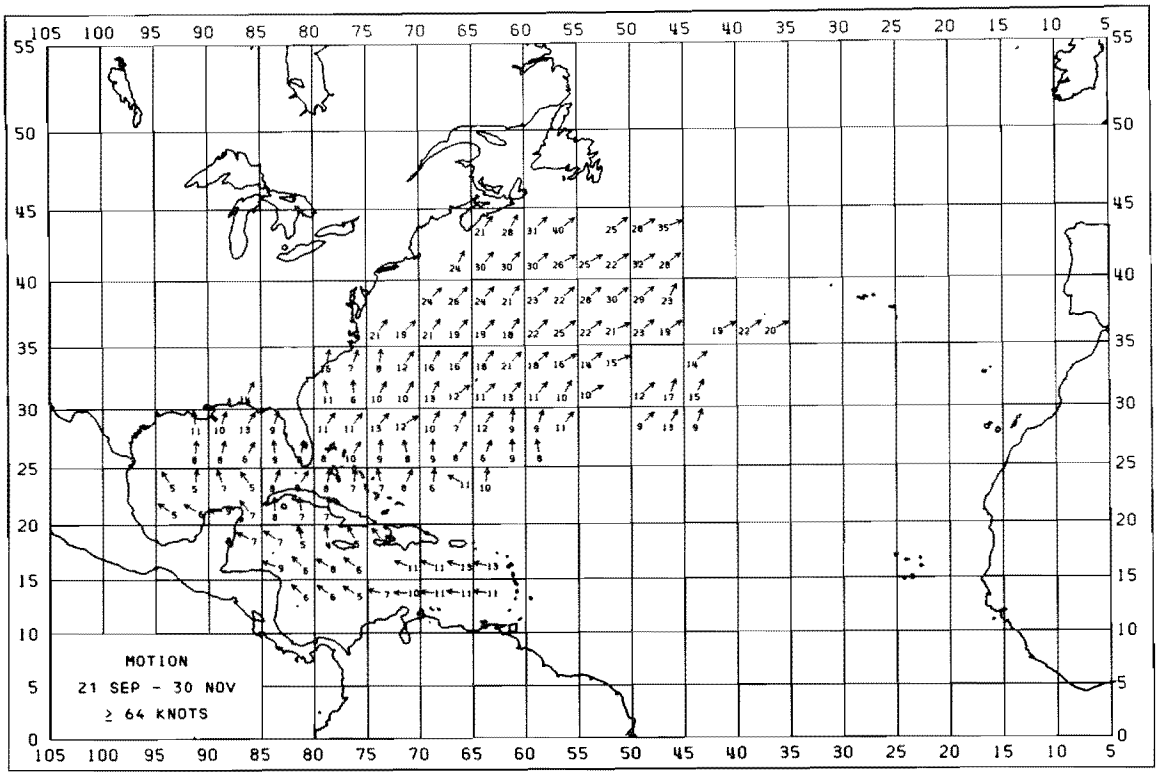
MOTION
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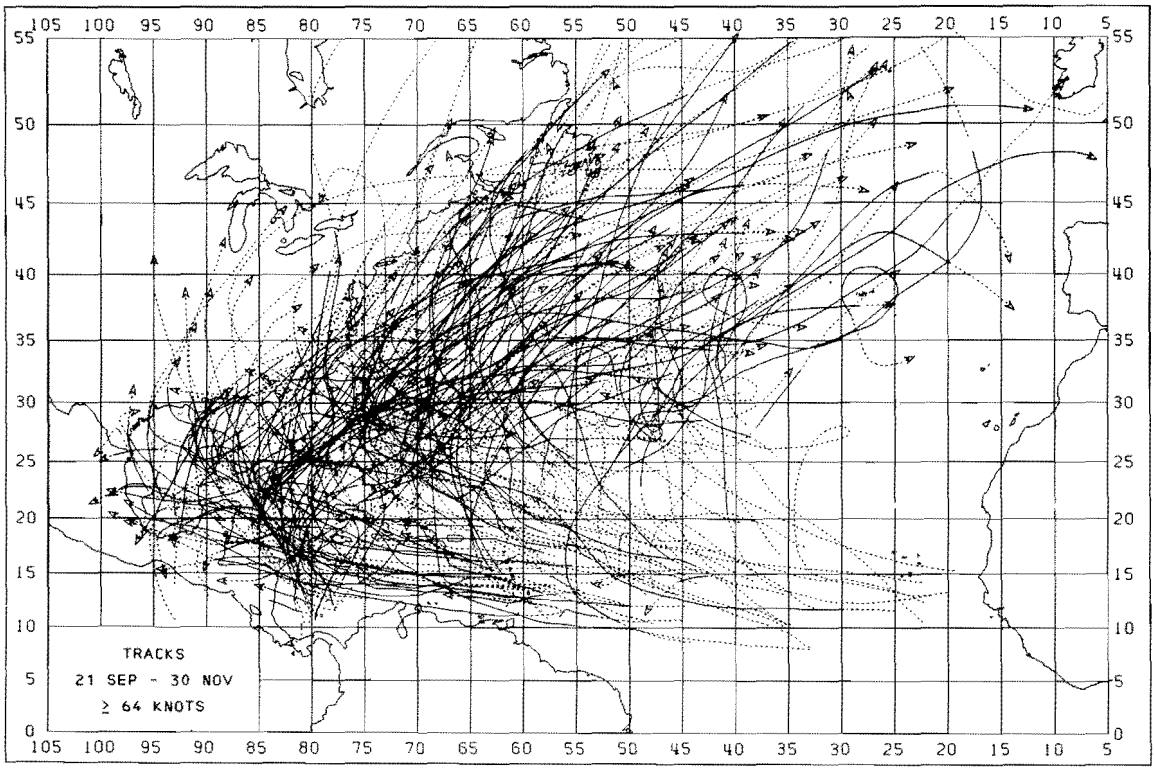

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119	7	307	6	7	4.24
120	8	302	5	8	2.33
121	6	285	7	9	3.37
122	6	272	10	10	2.44
123	7	275	11	11	2.64
124	8	277	11	12	1.72
125	6	277	11	11	2.22
153	6	289	9	10	5.01
154	17	316	6	8	3.50
155	8	302	8	9	3.04
156	8	309	6	9	2.98
158	6	291	11	13	3.74
159	6	291	11	12	3.67
160	7	287	13	14	2.36
161	5	281	13	14	2.71
188	9	298	7	10	5.10
189	15	304	7	9	4.10
190	15	345	5	7	2.65
191	8	353	4	7	2.06
192	5	333	5	7	3.15
193	6	320	7	10	3.34
221	8	305	5	8	1.99
222	7	299	6	8	2.06
223	6	271	9	10	3.98
224	11	320	7	9	3.79
225	16	358	8	9	3.39
226	10	352	7	8	3.05
227	10	007	7	11	4.58
257	6	327	5	9	1.69
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260	10	324	5	9	1.94
261	17	020	8	11	3.47
262	14	031	9	11	3.77
263	11	009	8	11	5.22
264	7	005	7	14	5.92
265	10	348	7	12	4.12
266	9	023	8	13	3.59
267	10	006	6	13	3.64
268	5	299	11	13	5.08
269	6	006	10	15	6.40
294	10	004	8	11	5.33
295	10	013	8	10	3.31
296	6	028	6	10	4.18
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306	8	359	9	14	5.89
307	7	351	8	13	5.34
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331	7	020	10	12	3.84
332	6	030	13	15	6.17
333	6	016	9	12	3.72
335	10	035	11	14	5.76
336	23	039	11	15	6.29
337	19	041	13	16	6.94
338	10	058	12	14	9.38
339	17	028	10	12	7.45
340	11	027	7	12	4.75
341	7	033	12	15	8.07
342	12	003	9	11	5.72
343	6	018	9	12	5.22
344	8	038	11	16	5.67
347	6	044	9	12	6.99
348	8	027	13	16	10.76
349	7	018	9	15	10.31
368	6	025	14	15	8.34
371	10	369	11	13	6.96
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373	17	028	10	13	6.87
374	13	032	10	16	7.48
375	17	026	13	17	6.77
376	15	054	12	15	9.27
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379	10	041	11	15	6.05
380	8	028	10	15	5.36
381	9	060	10	17	8.96
383	6	048	12	20	10.43
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385	5	027	15	16	10.78
407	7	010	16	18	11.54
408	10	020	7	10	5.84
409	11	005	8	13	8.66
410	13	034	12	16	8.61
411	16	030	16	17	5.29
412	12	041	16	17	5.78
413	11	036	18	19	5.54
414	10	044	21	23	4.24
415	13	048	18	21	5.37
416	10	059	16	19	7.06
417	8	052	14	16	9.25
418	6	069	15	17	10.51
421	7	048	14	16	7.61
445	5	036	21	23	11.80
446	7	046	19	19	9.03
447	9	036	21	23	6.34
448	16	042	19	20	7.52
449	15	044	19	19	7.65
450	11	034	18	20	5.07
451	12	045	22	24	7.42
452	9	052	25	27	9.10
453	10	054	22	23	8.88
454	6	067	21	23	9.45
455	5	049	23	30	12.29
456	7	056	19	24	12.60
458	8	064	19	20	9.29
459	6	058	22	22	7.57
460	5	062	20	21	6.94
483	9	045	24	25	8.72
484	12	042	26	27	11.21
485	15	042	24	26	10.09
486	16	036	21	23	8.08
487	9	049	23	23	11.28
488	8	048	22	23	8.09
489	7	049	28	29	9.49
490	6	052	30	30	8.58
491	5	048	29	31	7.00
492	6	026	23	25	14.70
520	9	027	24	27	11.63
521	11	040	30	33	12.13
522	13	040	30	32	11.22
523	11	050	30	31	14.26
524	9	059	26	27	14.80
525	12	061	25	26	13.21
526	10	056	22	23	13.57
527	5	057	32	34	13.24
528	7	052	28	29	11.30
557	6	036	21	22	10.07
558	6	028	28	29	12.04
559	9	045	31	34	14.39
560	7	052	40	43	17.62
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563	6	060	28	28	14.31
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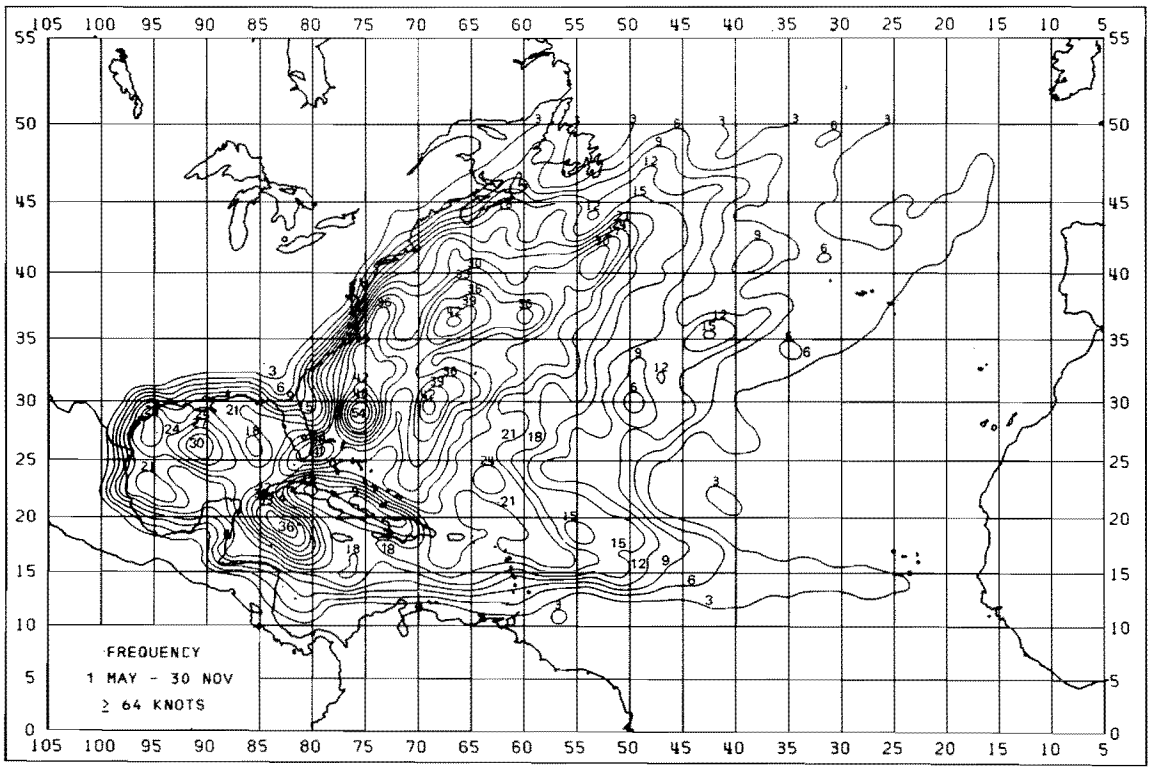
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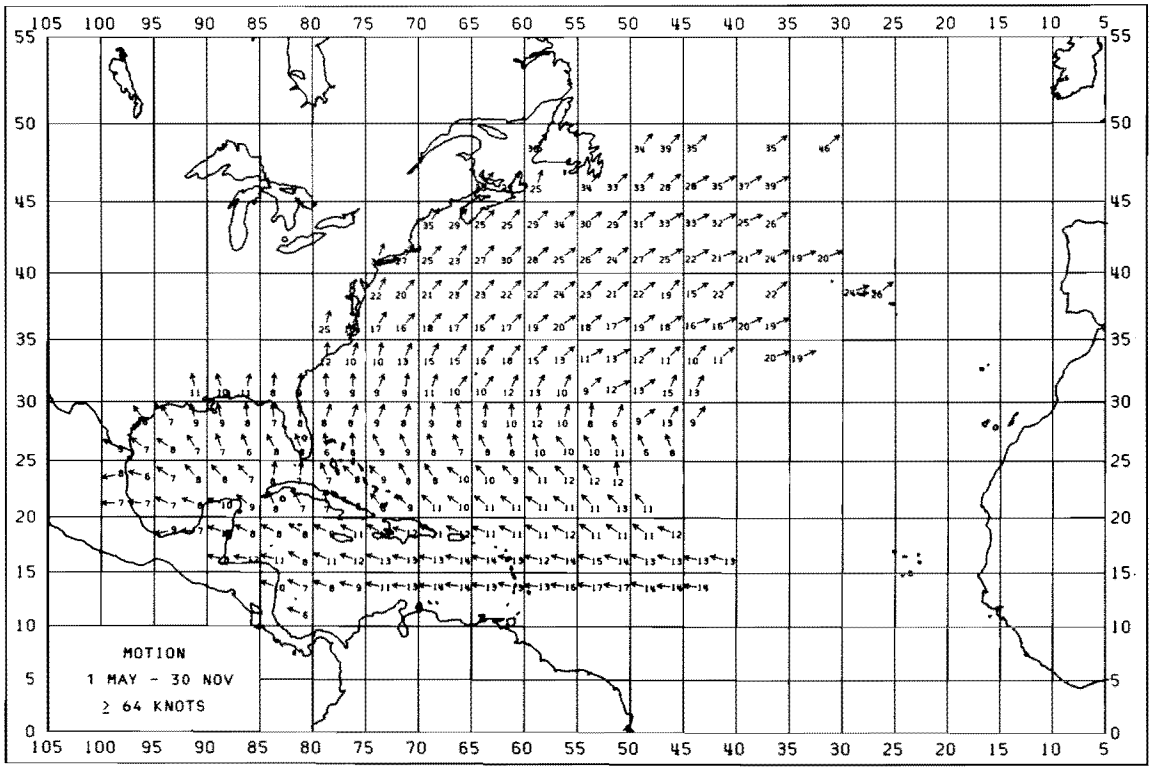
≥ 64 KNOTS


MOTION
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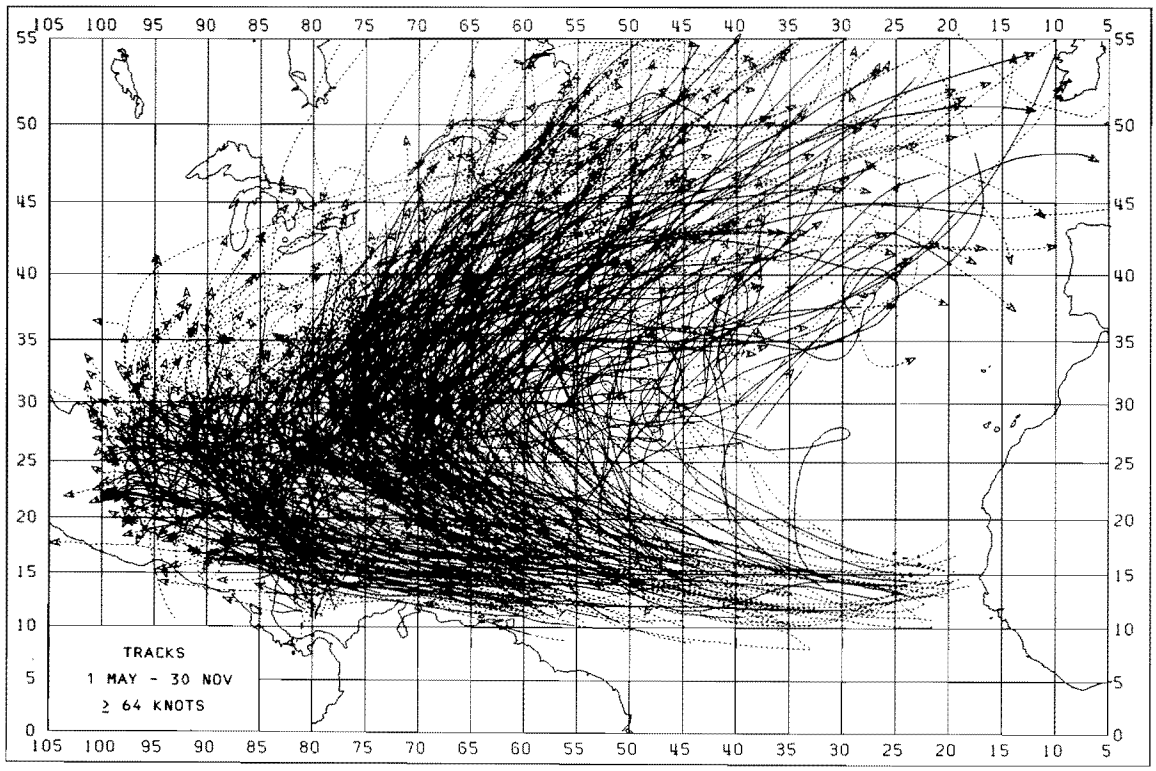

A	B	C	D	E	F
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118	11	296	7	9	5.28
119	13	291	8	10	5.21
120	15	285	9	11	4.99
121	11	282	11	12	4.56
122	11	274	13	13	4.90
123	13	275	14	14	4.57
124	15	280	14	14	3.90
125	15	279	13	14	4.54
126	9	283	13	13	2.58
127	7	275	13	14	1.63
128	6	278	16	17	5.42
129	7	280	17	17	5.03
130	12	280	17	17	4.22
131	9	286	14	15	4.00
132	6	275	14	15	3.41
133	6	275	14	14	2.58
151	12	283	8	10	3.19
152	15	280	12	12	4.06
153	16	287	11	12	4.58
154	25	302	8	10	4.45
155	20	295	11	12	4.84
156	18	291	12	13	5.62
157	15	289	13	15	4.81
158	19	284	13	14	3.74
159	22	282	13	14	3.78
160	21	284	14	14	3.83
161	20	281	14	14	3.99
162	19	283	13	13	4.06
163	21	283	12	13	3.86
164	23	286	14	15	5.59
165	18	287	15	16	6.15
166	15	286	14	14	6.00
167	12	290	13	14	5.16
168	10	288	13	14	4.72
169	8	282	13	13	2.82
170	6	286	13	13	3.18
185	5	256	9	10	4.64
186	7	271	7	8	5.14
187	9	289	10	11	5.55
188	21	296	8	10	4.23
189	31	298	8	10	4.12
190	37	303	8	10	4.30
191	18	297	9	12	5.48
192	16	296	11	13	5.10
193	14	299	10	12	3.68
194	9	286	12	12	2.58
195	22	296	11	12	3.40
196	23	293	12	13	2.84
197	22	290	11	12	3.35
198	21	295	11	12	3.26
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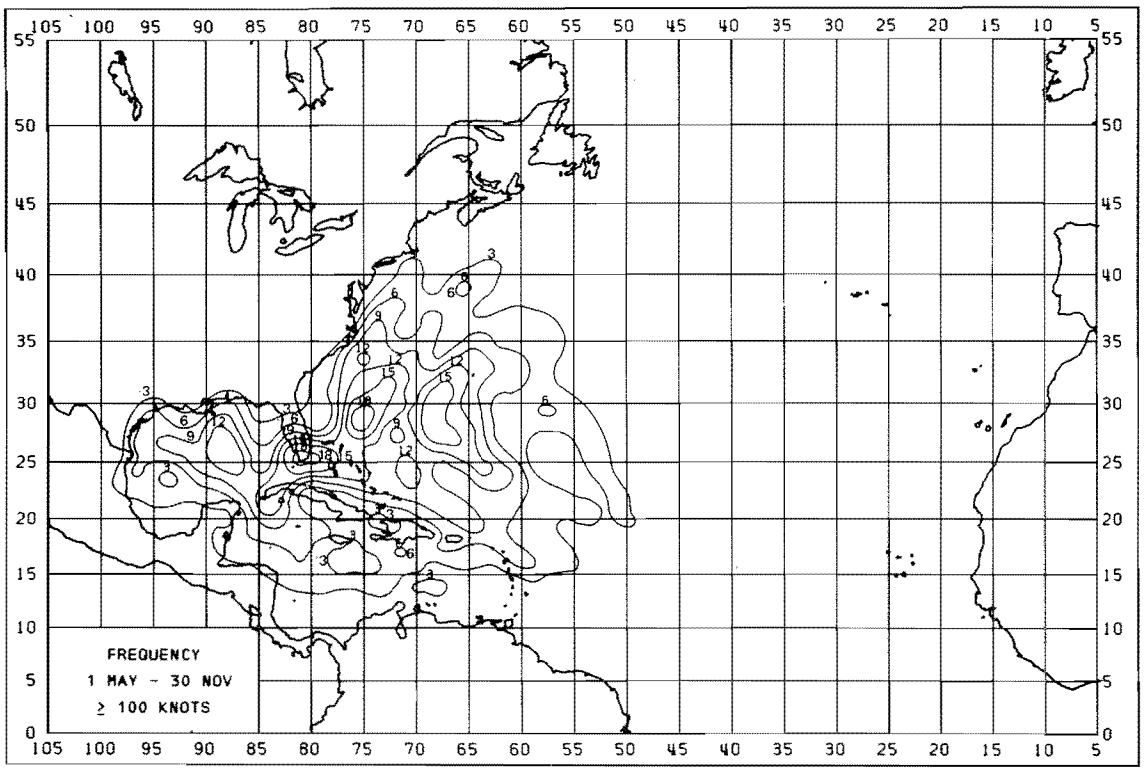
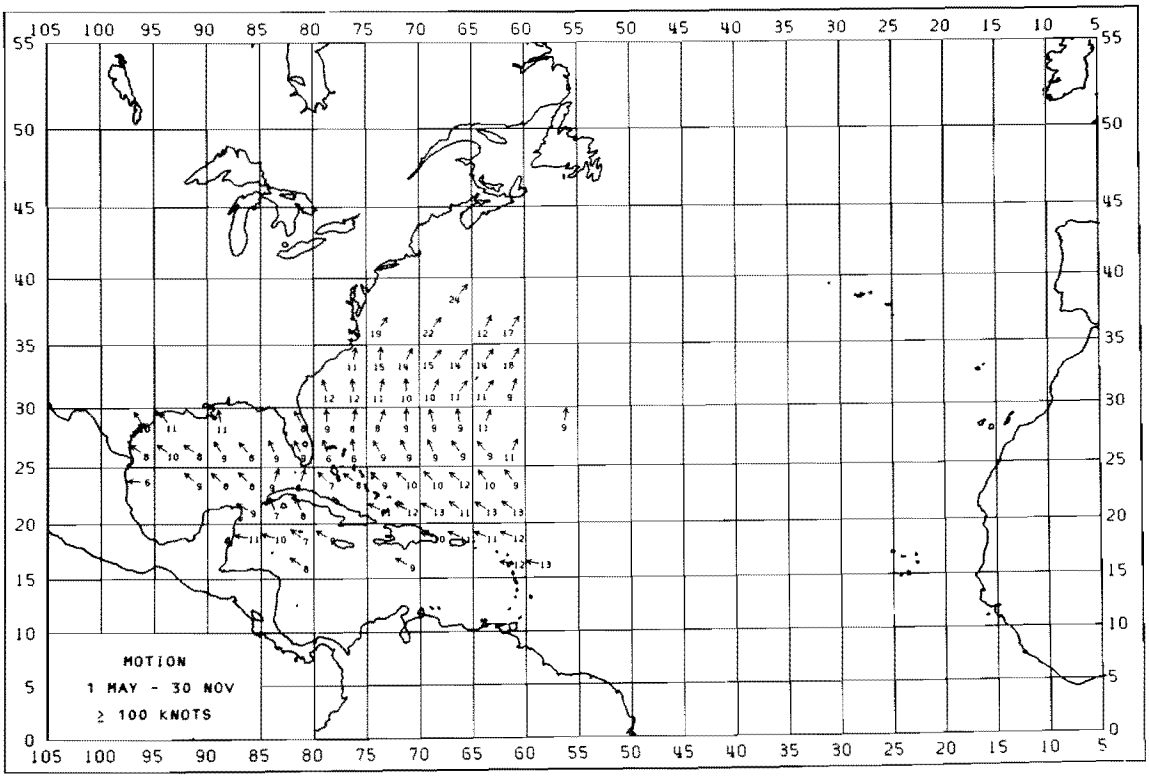
200	16	297	12	12	2.79
201	15	305	11	12	3.70
202	15	303	11	12	4.18
203	15	305	11	12	4.24
204	9	292	12	13	7.04
219	7	271	7	8	3.02
220	14	277	7	9	3.71
221	20	296	7	8	2.48
222	16	292	8	9	2.78
223	18	290	10	11	3.10
224	26	309	9	10	3.49
225	31	336	8	10	3.43
226	16	332	7	10	3.68
227	13	353	7	11	4.30
228	8	296	6	9	4.53
229	13	319	6	11	3.13
230	24	312	9	11	4.55
231	26	309	11	12	4.79
232	21	306	10	12	5.04
233	20	307	11	12	3.89
234	23	306	11	12	4.08
235	20	303	11	12	4.60
236	16	305	11	12	3.58
237	16	316	11	13	4.95
238	12	314	13	14	5.45
239	6	319	11	12	3.25
255	8	258	8	9	3.46
256	21	285	6	8	2.40
257	18	305	7	10	4.40
258	18	317	8	11	4.62
259	22	316	8	10	3.31
260	23	318	7	9	2.02
261	24	005	8	10	3.35
262	23	006	7	11	3.52
263	22	336	7	10	4.32
264	23	313	8	12	4.56
265	27	314	9	11	3.85
266	32	332	8	11	3.85
267	30	328	8	12	4.27
268	24	306	10	11	4.53
269	25	318	10	13	4.77
270	22	318	9	11	4.54
271	13	312	11	12	4.81
272	10	316	12	13	3.20
273	11	326	12	14	5.56
274	9	355	12	15	5.37
291	7	299	9	10	3.37
292	23	308	7	9	3.72
293	23	304	8	10	3.75
294	31	328	7	10	3.98
295	26	341	7	10	3.08
296	17	338	6	10	3.57
297	22	332	8	10	3.98
298	31	341	8	11	3.58
299	36	352	6	11	4.11
300	31	357	8	11	6.10
301	30	333	9	11	4.76
302	32	337	9	12	3.66
303	35	343	8	11	4.57
304	26	338	7	11	4.77
305	22	334	8	10	4.23
306	19	350	8	13	4.74
307	19	342	10	14	5.18
308	14	322	10	13	4.11
309	10	329	10	12	4.26
310	9	338	11	14	4.98
311	7	336	6	12	6.51
312	6	340	8	16	7.07
328	21	324	8	10	4.14
329	21	330	7	9	4.53
330	23	343	9	11	4.99
331	20	346	9	11	4.29
332	21	354	8	11	5.45
333	21	354	7	10	3.45
334	20	357	8	11	4.03
335	22	017	8	12	4.97
336	53	016	8	11	5.82
337	42	020	9	13	6.17
338	30	015	8	13	6.31
339	43	003	9	12	5.55
340	29	354	8	12	4.42
341	24	001	9	13	5.48
342	24	000	10	13	5.45
343	18	006	12	15	7.09
344	16	017	10	15	6.72
345	14	003	8	13	6.26
346	9	019	6	11	4.21
347	8	053	9	12	6.33
348	11	031	13	16	9.29
349	8	036	9	16	9.43
366	10	349	11	13	3.85
367	11	343	10	11	3.77
368	11	011	11	13	7.14
369	6	003	8	10	4.27
370	10	004	9	13	3.68
371	27	357	9	12	5.89
372	40	000	9	11	4.73
373	40	019	9	12	5.88
374	34	009	9	14	6.75
375	38	020	11	15	6.79
376	38	036	10	13	7.47
377	33	037	10	14	6.41
378	24	027	12	16	7.26
379	19	026	13	16	7.09
380	17	023	10	15	6.12
381	17	047	9	15	7.72
382	10	064	12	17	10.40
383	8	055	13	20	9.38
384	12	023	15	20	11.09
385	6	028	13	14	10.88
407	18	005	12	14	8.39
408	39	017	10	12	5.78
409	37	011	10	13	5.91
410	35	024	13	16	7.42
411	33	026	15	17	6.28
412	30	034	15	17	6.60
413	29	037	16	18	6.67
414	25	039	18	19	6.89
415	25	041	15	17	7.64
416	25	047	13	15	6.64
417	16	061	11	14	7.15
418	12	061	13	16	8.44
419	9	054	12	17	11.37
420	11	045	11	15	9.41
421	12	039	10	12	7.65
422	6	050	11	13	8.05
424	5	071	20	22	9.39
425	7	067	19	22	10.38
443	5	014	25	26	11.75
444	17	026	16	18	10.21
445	39	030	17	18	8.29
446	25	042	16	18	8.35
447	38	043	18	20	7.49
448	45	042	17	18	7.28
449	37	048	16	18	7.77
450	34	047	17	19	8.17
451	34	049	19	20	8.97
452	24	053	20	21	8.44
453	20	052	18	21	7.62
454	16	064	17	20	8.20
455	13	051	19	23	10.83
456	11	055	18	22	11.70
457	11	070	16	18	9.77
458	14	065	16	18	8.09
459	10	063	20	21	6.42
460	7	067	19	20	5.97
481	23	027	22	24	9.75
482	27	040	20	22	9.25
483	27	042	21	23	9.39
484	36	041	23	25	10.99
485	33	042	23	25	9.71
486	28	044	22	24	8.17
487	29	049	22	23	10.72
488	26	050	24	25	9.68
489	25	048	23	24	9.46
490	19	052	21	22	9.81
491	14	053	22	24	8.47
492	12	040	19	21	10.78
493	9	056	15	16	11.01
494	6	050	22	22	14.08
496	5	051	22	22	9.22
498	5	070	24	27	14.47
500	6	052	26	27	14.77
517	7	020	30	32	11.27
518	16	036	27	28	11.91
519	22	041	25	26	11.83
520	28	035	23	25	8.76
521	27	041	27	29	10.68
522	24	044	30	32	10.08
523	24	051	28	29	13.01
524	24	054	25	27	12.32
525	31	053	26	28	11.94
526	27	051	24	26	11.61
527	16	055	27	28	10.64
528	15	057	25	27	9.12
529	12	061	22	23	13.65
530	7	070	21	22	13.46
531	11	063	21	24	10.53
532	8	064	24	26	12.73
533	6	070	19	21	11.49
534	6	068	20	22	12.98
555	7	030	35	35	14.54
556	14	036	29	30	12.39
557	18	044	25	26	10.79
558	20	038	25	27	10.48
559	19	047	29	31	12.55
560	18	048	34	37	13.49
561	11	052	30	33	11.75
562	20	044	29	31	11.68
563	1/	053	31	32	12.04
564	16	060	33	34	9.92
565	12	065	33	34	10.66
566	9	064	32	34	11.70
567	7	068	25	28	10.92
568	5	055	26	27	8.53
593	5	038	36	37	13.55
594	11	039	29	30	12.36
595	6	017	25	26	10.95
597	8	043	34	36	8.73
598	11	046	33	34	9.68
599	13	043	33	35	9.89
600	10	048	28	30	9.84
601	11	060	28	30	8.80
602	12	059	35	37	10.01
603	9	060	37	38	9.88
604	5	062	39	40	13.24
631	6	041	30	31	11.99
635	6	039	34	36	13.19
636	8	043	39	41	10.46
637	6	048	35	36	7.35
640	5	052	35	36	12.54
642	6	048	46	49	15.10

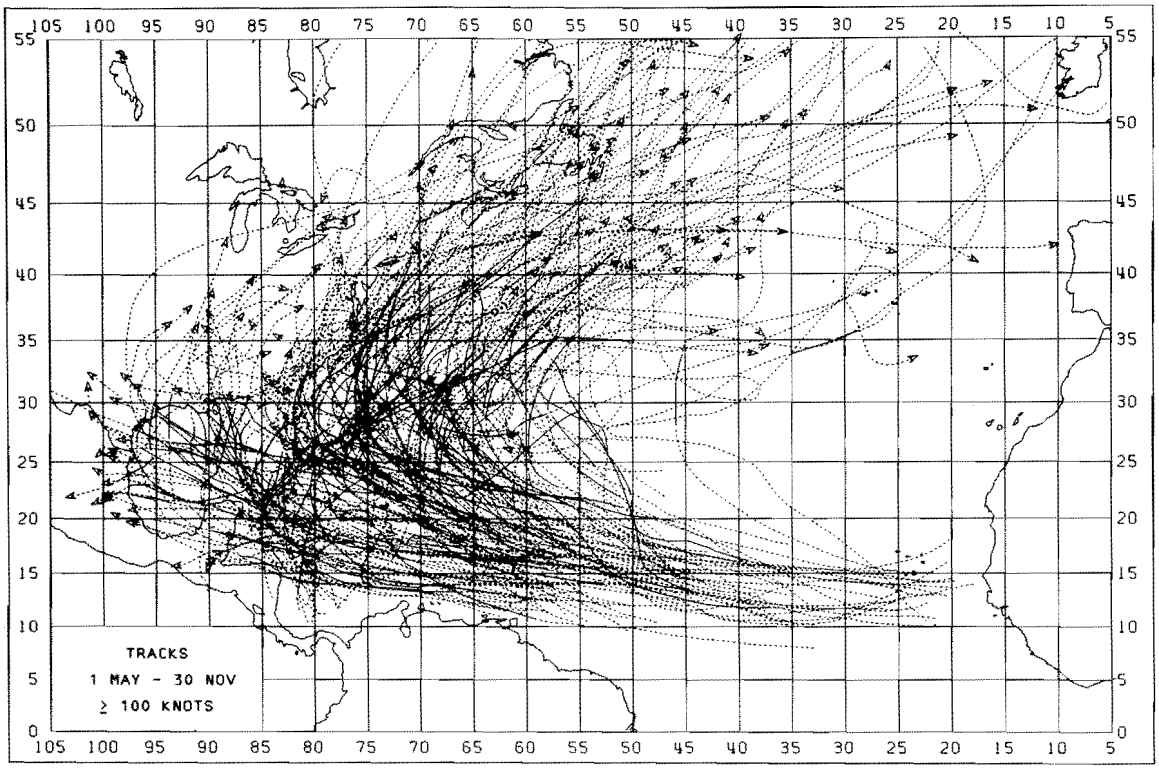
A.5 Chart Series C

Charts and tabular data in this series are based on portions of storm tracks having intensities of at least 100 knots and for the following periods:

STRATIFICATION PERIOD	PAGES
1 May – 30 Nov	A-56,57


FREQUENCY
1 MAY - 30 NOV
≥ 100 KNOTS


MOTION
1 MAY - 30 NOV
≥ 100 KNOTS



A	B	C	D	E	F
154	6	304	8	11	5.69
158	5	300	9	11	2.18
162	6	280	12	13	4.64
163	6	281	13	14	4.04
188	7	281	11	11	5.09
189	9	286	10	10	4.44
190	7	310	7	8	3.57
191	6	302	9	10	4.19
195	5	291	10	10	2.02
196	7	295	11	12	3.77
197	10	293	11	11	2.56
198	6	291	12	13	3.08
224	7	301	9	11	3.68
225	15	340	7	10	3.35
226	6	336	8	10	3.45
229	6	296	11	11	2.91
230	7	296	12	12	3.50
231	10	298	13	13	4.94
232	12	307	11	13	5.50
233	6	302	13	13	4.93
234	7	305	13	14	5.29
256	6	274	6	7	2.04
258	7	312	9	11	5.21
259	10	312	8	10	2.91
260	11	316	8	9	1.72
261	12	017	9	11	3.14
262	13	017	8	11	3.32
263	12	316	7	9	4.06
264	13	308	8	10	3.62
265	11	314	9	12	3.50
266	13	311	10	10	3.82
267	10	316	10	11	4.28
268	7	310	12	12	4.58
269	12	324	10	14	5.72
270	10	325	9	12	5.88
292	8	306	8	10	4.97
293	9	306	10	11	4.57
294	10	307	8	9	2.51
295	15	329	9	11	2.23
296	8	321	8	10	2.96
297	8	337	9	12	3.93
298	17	332	9	12	3.81
299	16	342	6	12	5.25
300	13	354	6	11	5.84
301	12	329	9	10	2.72
302	10	335	9	11	3.29
303	14	338	9	10	3.47
304	15	324	9	10	4.60
305	10	319	9	10	4.83
306	5	022	11	12	7.47
328	6	328	10	11	5.83
329	5	322	11	12	2.33
331	10	348	11	12	3.29

A	B	C	D	E	F
334	6	334	8	10	3.13
335	5	356	9	12	5.80
336	18	007	8	12	6.30
337	17	019	8	13	6.62
338	12	000	9	14	5.86
339	17	346	9	11	4.00
340	13	351	9	12	4.99
341	9	021	11	15	7.39
344	5	006	9	15	6.86
371	6	341	12	13	8.96
372	13	354	12	13	5.35
373	14	013	11	12	6.73
374	12	358	10	13	6.73
375	13	025	10	14	6.50
376	15	036	11	13	7.75
377	8	034	11	13	7.32
378	6	017	9	11	6.52
408	11	009	11	13	4.40
409	11	004	15	17	6.88
410	10	026	14	17	10.41
411	7	039	15	15	7.62
412	9	038	14	15	4.12
413	10	035	14	15	4.38
414	6	030	18	18	8.18
445	10	034	19	20	6.98
447	7	039	22	22	6.04
449	5	025	12	12	2.94
450	5	032	17	17	5.50
484	6	039	24	25	13.38

(Continued from inside front cover)

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