NOAA Technical Memorandum NWS TPC 2

TROPICAL CYCLONE INTENSITY CLIMATOLOGY OF THE NORTH ATLANTIC OCEAN, CARIBBEAN SEA, AND GULF OF MEXICO

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PREFACE

This Technical Memorandum is Part 1 of a two part paper.

Part 1 takes the Atlantic Tropical Cyclone "Best-track" Data File (BTDF) (1996), also known as the HURDAT (HURricane DATa file, Jarvinen et al., 1988) and uses the six-hourly data together with an extended version of the Saffir-Simpson Hurricane Scale (SSHS) (Simpson, 1974) to develop a ready reference for the maximum intensity of all tropical cyclones during the period 1886-1996.

Part 2 will make an attempt to document and correct some of the known deficiencies in the earlier (pre-1960) cases, and will contain a discussion expanding on the limitations of the wind speeds in the data set as given in Neumann et al. (1993) and Jarvinen et al. (1988).

[&]quot;Best-track" refers to tropical cyclone tracks as determined by the National Oceanic and Atmospheric Administration/National Weather Service/Tropical Prediction Center in post-analysis, in contrast to operational working tracks. Data not available in real-time may result in modifications to both track location and wind estimates prior to recording in this archive.

PART I

INTRODUCTION. The tropical cyclone charts for individual years as given in Neumann, et al. (1993) distinguish between tropical storm and hurricane intensity for the years 1886-1992 (and subtropical storms from 1967 on), but give no indication of the strength of the tropical storms or hurricanes. On the other hand, the Atlantic Tropical Cyclone Best-track Data File (BTDF) upon which the track charts are based, gives six-hourly positions and winds for the life of the storm. There is no ready reference which gives the intensity of each storm each year without having to consult a data printout or computer display, a resource which many people do not have.

The objective of this work is to develop a ready reference for the maximum intensity of all tropical cyclones during the period 1886-1996, not just landfalling United States hurricanes, as given in Jarrell, et al. (1992).

This has been done by using the BTDF file, updated through 1996, together with additional classifications of weak and strong tropical storms using an extended Saffir-Simpson Scale.

The result is a series of tables and figures presenting the data by years, months, regions, etc.

DATA SET. The BTDF is updated annually by the NOAA/NWS/Tropical Prediction Center. Many of the limitations of this data set are discussed in Jarvinen et al. (1988) and Neumann et al. (1993).

Of interest here are the wind speeds, and not the track locations. Among the limitations in wind speeds are estimates of tropical cyclone strength based upon satellite classification alone, and sparse data in the years prior to aerial reconnaissance. Other limitations are the various methods of measuring or estimating the sustained surface wind speed, such as different types of instrumentation over land, wind estimation from the state of the sea by observers aboard ships (and reconnaissance aircraft), and estimating surface winds from aerial reconnaissance data.

Part 2 of this Technical Memorandum will discuss some of these limitations in further detail when addressing specific storms or years in the record. The data presented in the tables and figures of Part 1 have taken the data, as is, without any attempt to correct some known deficiencies. It is believed that the overall climatology will not be significantly affected by any changes proposed in Part 2, although some individual storms/hurricanes might have a significant change.

PROCEDURE. The BTDF was examined for every year from 1886-1996. Each storm of each year was given a category based upon the SSHS. Table 1 shows the extended scale. For the extension, the authors have arbitrarily assigned a scale index number of minus one for a tropical storm with winds of less than 50 knots and zero for a tropical storm with winds of 50 knots or more. This was done in order to distinguish between weak (category minus one) and strong (category zero) tropical storms. Also note that 50 knots is currently used by the National Weather Service as the threshold for damaging winds.

Thus, tropical storms and hurricanes of all categories can be easily summarized as indicated earlier. For subtropical storms which never made the transition to tropical storm or hurricane, the index or category number was assigned in the same way, based upon the maximum sustained wind.

Recognizing the continuing uncertainties in the determination of the standard 33-feet (10-meters) wind above the surface, maximum sustained winds near the center of a tropical cyclone are estimated operationally in 5-kt increments. Refined after-the-fact estimates, as recorded in the BTDF, are also given in 5-kt increments. In the issuance of public advisories, however, these winds are first converted to miles-per-hour, then rounded to the nearest 5-mph. It is only in the case of 115-kt where this second rounding places the hurricane in a different category. Thus, 115 knots becomes 132.34 mph, which rounds down to 130 mph. According to Table 1, 115 kt is a category 4 hurricane, while 130 mph is a category 3 hurricane. In the present work, the BTDF wind estimates in knots are used in the assignment of category, without further rounding. Thus, a 115 kt This is noted hurricane is tabulated as a category 4 hurricane. here to aid future work, in which an apparent discrepancy might be noted with archived public advisories.

Therefore, the threshold wind speeds used in this study to assign Saffir/Simpson hurricane categories were: category 1 - 65 knots, category 2 - 85 knots, category 3 - 100 knots, category 4 - 115 knots, and category 5 - 140 knots.

Others using the BTDF and Hurricane Risk programs (Neumann, 1987), may choose to present the data in other ways. For example, Steven Wallace (1997) has classified tropical storms as a category zero and tropical depressions as a minus one in a different extended version of the SSHS, using the BTDF.

TABULATION. Table 2 shows the categorization of numbered storms/hurricanes in the Neumann et al. (1993) track book by the extended SSHS. This table is most useful for determining the maximum strength of any storm/hurricane in any given year.

Table 1. Extended Saffir/Simpson Hurricane Scale (winds only) used to categorize tropical cyclones in the Atlantic Best-Track Data File (BTDF).

EXTENDED SAFFIR/SIMPSON INTENSITY CATEGORIES

WIND SPEED **CATEGORY** MILES PER HOUR KNOTS 47 54 34 39 -1 63 48 55 73 0 74 95 64 83 1 96 84 96 - 110 2

111 - 130

131 - 155

> 155

3

4

5

97 - 113

114 - 135

> 135

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Table 2. Numbered storms/hurricanes in Neumann et al. (1993) updated through 1996, categorized by the extended Saffir/Simpson scale.

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              3
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                        6
                                   9 10 11 12 13 14 15 16 17 18 19 20 21
YEAR
1996 -1
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              1
                 1
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                        3
                          -1
                               4
                                      0 -1
                                             3
                                                1
          0
                     1
                        4
                            0
                                                        4
                                                           0 3
                                                                  0
                                                                      1
1995
     1
              0 -1
                               2
                                   2 -1 -1
                                             4
                                                3
                                                    1
              1
                 0
                     0
                        2
1994
      0
          0
                            1
          0 -1 -1
                     3
                        1
                            2
1993 -1
                               1
1992 -1
          4
             2
                 2
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                        0
                            1
1991 -1
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          3 4 -1
                     0 - 1
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                 2
                       -1
                            3
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      0
          1 -1
                    -1
                               0
                                      1
1990
                 2
                     2
                        1
                            4
                               5
                                   0
1989 -1 -1
              1
                                      1
                                          0
                           1
                               5
1988 -1 -1 -1
                 1
                     0
                        0
                                   4 -1
                                          4
                                             0
                        3
                            1
1987 -1
          1 -1 -1
                    -1
1986 -1
          1
              1
                 0
                     2
                        1
              1
                 1
                     3
                        0
                           4
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                                   0
                                      1
                                          3
1985
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          1
                     4
                        0
                            0 -1
                                   1
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                                                1
       0 -1 -1
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1984
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1983
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1982
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                    -1
                        4
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                               1
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1979
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                        4
                            2
                               4
                                   0 -1 -1
                                             1
             -1
1978 -1 -1
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                 1
                     1
                        0
       5
          1
1977
                            3 -1
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                                      1
                 1
                    -1
                        2
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1976 -1 -1
                        2
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                           4 -1
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1975
       0
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                        4 -1
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1974
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1973
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1972
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1966
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1965 -1
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                                          3 -1
                            3 -1
                                   4
                 -1
                     4
                         4
       0 -1
              0
1964
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                     1
                         2
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1963
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         -1
              0
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1962
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                     4 -1
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                  3
       3
1961
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1960 -1
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1958 -1
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1957
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                 -1
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                  2 -1
1955
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                                    4 -1
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               2
                  2
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       1 -1
1954
                                              0 -1 -1
                                    1 -1
                                           0
                                3
               0
                  4
                     3
                         3
                             0
           2
1953
        0
                  3
                      1
                         2
                             4
           2
               3
1952 -1
                     5
                         3
                             0
                                2
                                    1
                  3
               4
           0
 1951
        3
                                           3
                                              0
                                                  1
                             2
                                0
                                    2
                                       3
                   5
                      3
               3
 1950
        4
           3
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Table 2. Continued
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1949
     2 4 -1
               3 -1 -1 0
                          2 1 4 2 0 0
1948 -1 -1
           3
                 1 4
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                       3
                           4
                              1
1947 -1
            1
               5 -1 0 -1
         2
                           1
                              3
1946 -1
               2
         1 -1
                  4 -1
1945
     3 -1
            0
               0
                  4
                     0 -1
                           0
                              4
                                2
                                    2
1944
     1
         0
            1
               3
                  0 -1
                       4
                           1
                              2 -1
                                    3
1943
     1
         0
            4
               3 -1 2
                        0
                           0
                             2 -1
1942
         3
            2 -1
                 -1 -1
     1
                        0 -1 -1
                                 2
1941 -1
         1
            1
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                  3 -1
1940
            1
               1
                  2 -1 -1 -1
     0
         1
1939 -1
         1 -1
               4
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     0
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1938
                  0 -1 -1 0
1937
         0
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               2
                  2 -1 2 -1 -1
     0
           1 -1
1936 -1
        -1
                  1 -1 -1 1 -1
                                1 2 -1 3 -1 2 -1
1935
         5 -1
              3
     3
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                    1
         1
           1 -1
                     2 -1
1934
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                           2 0 -1
                                    1
                    0 -1 3 -1 -1
         2 -1 -1
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1933 -1
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                                    3
                                                2 -1 -1 4 2 0 -1
         4
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              5 -1 -1 3 -1 -1 4
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1932 -1
1931 -1
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           0 -1
                 3 2 -1 -1 -1
1930
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1928
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                  0 -1 -1
1927
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                    4 -1
1926
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               4
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1925 -1
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           2 -1 -1 -1 -1
1923
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1922 -1
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1921
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1920
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1919
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         4 -1
1918
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1917 -1
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                     2 -1 -1 2 3 -1 3 3 1
         3
1916
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               2
                  4
         4
1915 -1
1914 -1
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1913
         1
            2
               0
                  2 4
1912
     0 -1
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               1
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            2 -1
1911
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1910
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1906 -1
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         0 -1
               1 -1
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1902 -1
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1901 -1
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                  0 -1 -1
         2 -1
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Table 2. Continued

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1899
     1
        3
          3
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1898
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1896
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1892 -1
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Table 3 shows the sums of tropical storms and hurricanes of various strength categories for each year using the extended SSHS (Table 1). A major hurricane is here defined as a category 3, 4 or 5 on this scale. This table is probably most useful for obtaining the maximum and minimum number of any category and/or the rank of any category by year from maximum to minimum or vice-versa.

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Table 3. Sums of tropical storms (T) and hurricanes (H) of various strength categories using the extended Saffir/Simpson scale.

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	-1	0	1	2	3	4	5	ALL (T+H)	T	Н	MH (MA JOD)
YEAR								(1 111)			(MAJOR)
1996	3	1	3		4	2		13	4	0	_
1995	3	5	4	2	2	3		19	4 8	9	6
1994		4	2	1	_			7		11	5
1993	3	1	2	1	1			8	4	3	0
1992	1	2	ī	2	_	1		7	4	4	1
1991	3	1	ī	ī	1	ī		8	3	4	1
1990	3	3	5	2	1	_		14	4	4	2
1989	2	2	3	2	_	1	1	11	6	8	1
1988	4	3	2	2		2	1	12	4	7	2
1987	4	3	2		1	2	1	7	7	5	3
1986	i	1	3	1	_			6	4	3	1
1985	-	4	4	-	2	1		11	2	4	0
1984	3	5	3	1	Z	1		13	4	7	3
1983	•	1	2		1	_		4	8	5	1
1982		4	1		_	1		6	1	3 2	1
1981	1	4	3	1	2	1		12	4	2 7	1
1980	_	2	4	3	1	_	1	11	5		3
1979	2	1	3	1	_	1	1	9	2	9	2
1978	5	2	2	1		2	1	12	3 7	6	2
1977	3	1	4	-		2	1	6		5	2
1976	4	_	2	2	2		_	10	1	5	1
1975	1	2	1	2	2	1		9	4 3	6	2
1974	3	4	1	1	1	1 1		11	3 7	6	3
1973	1		3	Τ.	1	_		8		4	2
1972	1	3 3 6	2	1	Τ.			7	4	4	1
1971	1	5	4	1			1	13	4 7	3	0
1970	1	4	2	i	2		-	10		6 5	1
1969	1	5	5	2	4		1	18	5 6	12	2
1968	_	3	5	2	-		_	8			5
1967	1	1	4	1			1	8	3 2	5 6	0
1966	3	1	4	_	2	1		11	4	7	1
1965	2	_	2	1	2	1		6	2	4	3
1964	4	2	2		2	4		12	6	6	1 6
1963	1	1	2	3	1	1		9	2	7	_
1962	1	1	2	2	1			5	2	3	2
1961	i	2	1	2	3	2	2	11	3	8	1 7
1960	2	1	1	1	3	2	2	7	3	4	2
1959	2	4		-	1	1	2	11	4	7	2
1958	1	2	5 2 1		2	2	1	10	3	7	2 5
1957	2	3	1		2	2 2	_	8	5	3	2
1956	1	3	2		1	1		8	4	4	2
1955	1	3 3 2	2 1	2	4	1 1 1	1	12		9	2 6
1955	2	1	3	3		1	T	11	3 3 8	<i>9</i> Ω	2
1954	3	5	1	1	T	1		14	Ω	6	4
1953	1	5	1	2	1 3 2	1		7	1	6	2
1952	1	2	2	1	2	1	1	10	1 2	9 8 6 6 8	3 5
1951		2	1	2	3 5	2	1	13	2	11	8
TADO		4	T	Z	ے	4	_	τ.	4	T T	0

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Tabl
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1902
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 Table 3. Continued

1899	1		1	1	3		6	-	_	
1898		5	1	3			_	_ _	5	3
1897	2	1	_	2			9	5	4	0
1896				4	2		5 6	3	2	0
1895	1	3		7	1		6	0	6	2
1894		1		3	2		6	4	2	1
1893		2		7	3		_	1	5	2
1892	2	3		4	3	•	12	2	10	3
1891	2	1		8			9	5	4	0
1890	_	_		1		•	11	3	8	0
1889	7	- 2					1	0	1	0
1888	-	4		5			9	4	5	0
1887	1	6		_	2	_	9	4	5	0
1886	_	2		8	2	_	L 7	7	10	2
1000		4		8		1	-0	2	8	0

One example of information from this table is that the year 1955 is the only year thus far to have had at least one occurrence of each category (at maximum intensity) from minus one to category five. The active year of 1955 had one weak (-1) tropical storm, two strong (0) tropical storms, one category 1 hurricane, two category 2 hurricanes, four category 3 hurricanes, one category 4 hurricane, and one category 5 hurricane. The total of twelve named storms included nine hurricanes of which six were major hurricanes.

Figure 1 gives a graphical depiction of this information for named systems, hurricanes, and major (category 3 or greater) hurricanes.

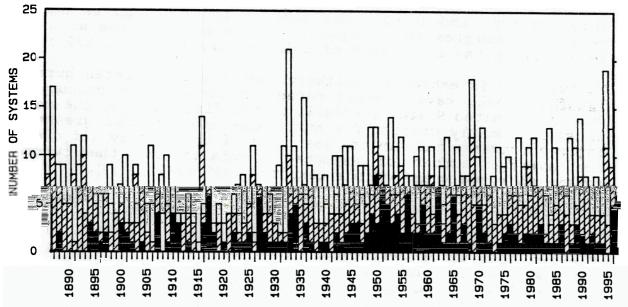


Figure 1. Bars depict number of named systems (open), hurricanes (hatched), and hurricanes category 3 or greater (solid), 1886-1996.

Also of interest are the interdecadal changes in the frequency of tropical storms and hurricanes. Table 4 gives decadal totals for each category, as well as for tropical storms, hurricanes, and major hurricanes.

It is frequently asked whether or not the total tropical cyclone activity in the North Atlantic basin has any relationship to the number of landfalls along the mainland United States coastline.

This question is addressed in Table 5, which gives a comparison of the decadal totals of hurricanes and major hurricanes for the entire North Atlantic basin, with subtotals for U.S. landfalls (landfall subtotals after Table 5, Hebert et al.,1997). It is interesting to note that the maximum number of landfalling United States hurricanes given in Table 5 (bolded) occurs in the decade of the forties, but when hurricane activity for the entire North Atlantic basin is considered, there are many more hurricanes in the decade of the fifties. The total number of major hurricanes for the entire basin is also much higher in the decade of the fifties. The number of major hurricanes making U.S. landfall also reaches a maximum during this decade.

What is particularly striking is the percentage of the total number of hurricanes and major hurricanes to strike the United States in the first fifty years of this century versus the ensuing forty-seven years. In the first fifty years (Table 5, bottom) the percent of both hurricanes and major hurricanes which formed in the North Atlantic basin and then struck the United States was slightly above 40%. In the following forty-seven years, the percent of both was 25%.

It can be argued that detection was poorer prior to 1950. Even though aerial reconnaissance was available in the forties, communications restrictions during World War II were in effect. This argument undoubtedly has some merit, although it has been generally accepted that tropical cyclone activity was at a lower level during the early part of this century (Neumann, 1993).

However, it is extremely unlikely that a United States hurricane landfall would have escaped detection during this century. The number of United States landfalls in the first half of the century is significantly greater for hurricanes and somewhat greater for major hurricanes than in the last half of the century (if one uses the average number of expected landfalls for the currently remaining three years of the century, 1997-1999).

Since it is far less likely that a hurricane would completely escape detection in the years since 1950, it would appear that: 1) An average of one out of every four hurricanes, as well as one out of every four major hurricanes, that form in the North Atlantic basin will strike the mainland United States! 2) The decade of the nineties has seen an upturn in total hurricane activity without a corresponding increase in U.S. landfalls. Depending upon activity during the remainder of the decade, this could result in the lowest number ever observed in any decade.

Table 4. Decadal totals of the number of tropical cyclones by category. Note that data for the 1880's and 1990's are not available for the full decade.

YEARS	-1	0	1	2	3	4	5	ALL (T+H)	T	Н	MH (MAJOR)
1990-96	16	17	18	9	9	7	0	76	33	43	16
1980-89	15	26	27	8	7	7	3	93	41	52	17
1970-79	19	26	24	10	8	5	3	95	45	50	16
1960-69	16	17	24	10	13	9	6	95	33	62	28
1950-59	11	24	19	11	22	13	4	104	35	69	39
1940-49	27	16	16	13	11	9	1	93	43	50	21
1930-39	39	12	15	15	8	6	3	98	51	47	17
1920-29	14	6	9	13	7	8	1	58	20	38	16
1910-19	10	5	6	12	12	4		49	15	34	16
1900-09	23	16	4	18	6	7		74	39	35	13
1890-99	8	16	2	34	11			71	24	47	11
1886-89	2	15		26	2			45	17	28	2

Table 5. Decadal totals of the number of hurricanes and major hurricanes in the North Atlantic basin versus those which made landfall in the United States. Note that data for the 1990's are not available for the full decade.

	HUR	RICANE	MAJOR HURRICANES					
YEARS	ATLANTIC	U.S.	% ATLC.	ATLANTIC	U.S.	% ATLC		
1990-96	43	7	16	16	4	25		
1980-89	52	16	31	17	6	35		
1970-79	50	12	24	16	4	25		
1960-69	62	15	24	28	6	21		
1950-59	69	18	26	39	9	23		
1940-49	50	23	46	21	8	. 38		
1930-39	47	17	36	17	8	47		
1920-29	38	15	39	16	5	31		
1910-19	34	19	56	16	8	50		
1900-09	35	16	46	13	6	46		
1900-49	204	90	44	83	35	42		
1950-96	276	68	25	116	29	25		

Table 6 depicts the same information as Table 4, but broken down for the periods 1886-1899, 1900-1949, 1950-1996, and the entire period of record, 1886-1996. Of course, the data in Tables 2 and 3 from which these totals are derived can be used to stratify or sort tropical cyclone activity any way one chooses.

Table 6. Same as Table 4, but broken down for the periods 1886-1899, 1900-1949, 1950-1996, and the entire period of record, 1886-1996.

YEARS	-1	0	1	2	3	4	5	ALL (T+H)	T	Н	MH (MAJOR)
1886-99 1900-49 1950-96	10 113 77	31 55 110	2 50 112	60 71 48	13 44 59	0 34 41	0 5 16	116 372 463	41 168 187	75 204 276	13 83 116
1900 -1996	190	165	162	119	103	75	21	835	355	480	199
1886 -1996	200	196	164	179	116	75	21	951	396	555	212

Another question of interest is: Which are the most intense hurricane(s) of record? Table 7 ranks all major hurricanes based upon the maximum sustained wind given in the BTDF. Together with the track book and/or the BTDF, the most intense hurricanes for various parts of the North Atlantic, Caribbean Sea, and Gulf of Mexico can be found.

Based upon the BTDF, only eight hurricanes have had sustained winds of 150 knots or more, with Hurricanes Camille in 1969 and Allen in 1980 the strongest at 165 knots. Fortunately, only eight of the twenty-one category five hurricanes struck any land mass with only two of them striking the United States mainland (H. Camille, 1969, and the Labor Day Hurricane of 1935). Atlantic category 5 hurricanes are also listed chronologically and discussed in Rappapport and McAdie (1991).

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	1986	-	-		<u> </u>	-00.00			- C	OG
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ΓA		1977	1	HU	150					A
/ID		1979	4	HU	150					D
AMED		1928	4	HU	140		-+		-	IOT
	F	1932	4	HU	140				-	OT
AMED	- [1935	2	HU	140					
MED	F	1938	4	HU	140		-		-	IOT
MED		1947	4	HU	140				100	IOT
AMED	-	1951	5	HU	140		0.0	1 1 1	N	OT
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UGO	-	1989	8	HU	140					-
	-	1957	4	HU	135		2.7	CAR	RIE	
	-	1964	5	HU	135		- 4	CLE	-	
	-	1965	3	HU	135			BETS	-	
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	7	1933						NOT NA	MED	
	1	1949		HU				NOT NA	MED	
	1	1952	2 7	HU	130			FO	X	- 70
	1	1953	3 4	HU	130			CAR	OL	
	1	1964	10	HU	130			HILD	A	
	1	1966	9	HU	130			INE	Z	
	1	1974	6	HU	130		- 3	CARN	MEN	
	1	1995	12	HU	130	 		LUI		
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	-	1906	_	-		4		NOT NA		
	-	1906	-	-	+			NOT NA	Tell	10
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		1989		HU	125			GABRI	ELLE	
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_	1950	6	1	U	120			FOX	
-	1954	9	-	U	120			HAZEL	
-	1956	8	H	U	120	2.1	1,0	GRETA	
1	1959	8	H	U	120	*		GRACIE	
	1961	2	H	U	120	34		BETSY	
1	1975	7	H	U	120			GLADYS	3 1
1	978	6	H	U	120			ELLA	
	995	6	H	U	120			FELIX	
1	996	8	H	U	120	2		HORTENS	SE
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_	949	10	Н		115			NOT NAME	
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1970	3	HU	110	CELIA					
1970	6	HU	110	ELLA					7
1975	5	HU	110	ELOISE					-
1985	5	HU	110	ELENA					
1987	6	HU	110	EMILY			7		
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1887	5	HU	105	NOT NAM	ED		ur T		111
1893	3	HU	105				2,70		7
1893	6	HU		NOT NAM					-
1893	9	HU		NOT NAM			7.0		
1894	3	HU		NOT NAM			7.00		-
1894	4	HU	105	NOT NAM	ED	-		10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-
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1896	4	HU	105	NOT NAME	ED	7.7		V 1 1	
1899	2	HU	105	NOT NAME	ED				_
1899	3	HU	105	NOT NAME	ED	74	1		
1899	4	HU		NOT NAME					-
1900	4	HU	105	NOT NAME	ED		3		
1901	5	HU	105	NOT NAME	D		7		
1903	2	HU	105	NOT NAME	D		+	. 7.11	
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1909	5	HU	105	NOT NAME	D			3.81	
1909	9	HU	105	NOT NAME	D			-	
1910	2	HU	105	NOT NAME	D			- 191	
1910	3	HU	-	NOT NAME	_			7	
1910	4	HU	105	NOT NAME	D		7		
1915	3	HU	105	NOT NAME	D				-
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1917	2	HU .	J 10	5 NOT NA	MED		=	- 4	
1917	3	HU L	10	5 NOT NA	MED	_		-	
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1923	-	HU L	J 10	5 NOT NA	MED	-			
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1948	7	HU	105	NOT NAMED		Contract to
1950	2	HU	105	BAKER		
1950	10	HU	105	JIG		
1950	11	HU	105	KING		
1952	3	HU	105	BAKER		
1952	4	HU	105	CHARLIE		
1954	5	HU	105	EDNA		
1955	3	HU	105	DIANE		
1955	9	HU	105	IONE		1111
1956	3	HU	105	BETSY		
1961	4	HU	105	DEBBIE		
1963	2	HU	105	BEULAH		
1969	4	HU	105	DEBBIE		
1976	3	HU	105	BELLE		
1981	9	HU	105	IRENE		
1985	11	HU	105	KATE		
1990	7	HU	105	GUSTAV		3 300
1996	6	HU	105	FRAN	773 795	100
1942	2	HU	100	NOT NAMED		The state of
1945	1	HU		NOT NAMED		
1950	3	HU	100	CHARLIE		
1951	1	HU	100	ABLE		
1951	4	HU	100	DOG		
1951	6	HU	100	FOX		
1953	5	HU	100	DOLLY		
1955	12	HU	100	KATIE		
1958	5	HU	100	ELLA		
1961	1	HU	100	ANNA		
1962	5	HU	100	ELLA		
1964	7	HU	100	ETHEL	100	
1969	6	HU	UNISHED THE	FRANCELIA		
1969	9	HU	100	INGA		
1973	6	HU	100	ELLEN		
1974	5	HU	100	BECKY		
1975	3	HU	100	CAROLINE	7000	
1976	7	HU	100	FRANCES		S == 1
1980	6	HU	100	FRANCES	101	
1981	6	HU	100	FLOYD	100	
1983	1	HU	100	ALICIA	- 10 / C (T)	THE RESERVE
1991	2	HU	100	BOB	C IVE	1000
1993	5	HU	100	EMILY		
1995	13	HU	100	MARILYN		
1995	17	HU	100	ROXANNE		
1996	2	HU	100	BERTHA		
1996	9	HU	100	ISIDORE		
1996	12	HU	100			

The question of where hurricanes in the North Atlantic basin during the period 1900-1996 reached major hurricane status can be answered by examination of Figure 2. The North Atlantic basin has been divided into six sub-basins: 1) Gulf of Mexico (G), 2) Caribbean Sea (C), 3-6) Atlantic areas A-1, A-2, A-3, A-4. These latter four sub-basins were chosen based upon the prevailing origins and tracks given in the track book, as well as a recognition that atmospheric/oceanic factors which might contribute to reaching major hurricane status are different in those areas, as well as the Gulf of Mexico and Caribbean Sea.

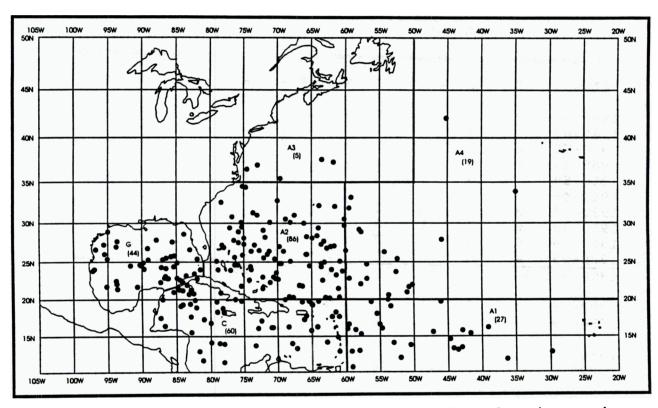


Figure 2. Solid circles indicate locations where hurricanes have attained sustained wind speeds of 100 kt, 1886-1996, as given in the Atlantic best-track file. If winds subsequently fall below, and again reach 100 kt, that position is also shown.

It is left to other studies to explore any physical relationships, but Figure 2 shows that a hurricane can reach major hurricane intensity almost anywhere in the North Atlantic basin when conditions are favorable.

The number of hurricanes reaching major hurricane intensity in each sub-basin is further stratified by decade in Table 8. Decadal variation is again evident. Note that the totals in Table 8 record only the first occurrence of 100 kt winds, or greater, and do not include subsequent re-intensification as shown in Fig. 2, thus accounting for the smaller sub-basin totals shown in the table. The noticeable lack of tropical cyclones reaching major hurricane intensity east of longitude 60 degrees West (A-1 and A-4) prior to 1950 certainly suggests an observational deficiency in those areas.

Table 8. Number of hurricanes to reach major hurricane intensity in each sub-basin shown in Figure 2, by decade. Note that data for the 1880's and 1990's are not available for the full decade.

YEARS	G	С	A-1	A-2	A-3	A-4	ALL
1990-96	1	2	3	7	1	2	16
1980-89	3	3	5	4	1	1	17
1970-79	6	3	1	3	1	2	16
1960-69	6	5	5	7	1	4	28
1950-59	3	10	6	15	0	5	39
1940-49	4	6	1	9	0	1	21
1930-39	3	6	1	7	0	0	17
1920-29	0	5	1	9	0	1	16
1910-19	4	5	0	7	0	0	16
1900-09	4	5	0	3	0	1	13

1890-99	1	5	1	3	0	1	11
1886-89	0	0	0	2	0	0	2
1886-							
1996	35	55	24	76	4	18	212

G = Gulf of Mexico

The next three tables - Tables 9, 10, and 11 - are adapted from Hebert et al. (1997), but are here expanded to include major hurricanes. Table 10 in this document, however, excludes U.S. landfalls as it did in Hebert et al. (1997).

Average number of occurrences is given in Table 9. Note that the frequently used average of two major hurricanes per year is quite valid, although the average for the past 50 years has been slightly higher, possibly because of aerial reconnaissance and satellite coverage.

C = Caribbean Sea

A-1, A-2, A-3, A-4 Atlantic sub-basins

Table 9. Average number of tropical cyclones which reached storm, hurricane, and major hurricane strength for various periods. Adapted from Hebert et al. (1997).

			GE NUMBER	
PERIOD	Number of years	Tropical Cyclones	Hurricanes	Major Hurricanes
1886-1996	111	8.6	5.0	1.9
1947-1996	50	9.9	5.9	2.5
1957-1996	40	9.7	5.6	2.2
1967-1996	30	9.9	5.6	1.8
1977-1996	20	9.8	5.5	1.9
1982-1996	15	9.7	5.3	1.9
1987-1996	10	10.6	5.8	2.2

(Includes subtropical storms after 1967)

Monthly variation in tropical cyclone activity appears in Table 10. Note for example that over fifty percent of all major hurricanes occur during the month of September, and that one of every two hurricanes in September is a major hurricane. By contrast, about thirty percent of August and October hurricanes become major hurricanes.

Table 10. Tropical cyclones, hurricanes, and major hurricanes in the Atlantic, Caribbean, and Gulf of Mexico 1886-1996 by month of origin. Adapted from Hebert et al. (1997).

	TROPICAL	CYCLONES1	HURR	ICANES	MAJOR HURRICANES		
MONTH	Total	Average	Total	Average	Total	Average	
JANUARY-APRIL	4	*	1	*	0	0.00	
MAY	14	0.1	3	*	1	*	
JUNE	60	0.5	24	0.2	3	*	
JULY	74	0.7	38	0.3	6	0.07	
AUGUST	234	2.1	161	1.5	45	0.46	
SEPTEMBER	318	2.9	201	1.8	109	1.12	
OCTOBER	196	1.8	100	0.9	31	0.32	
NOVEMBER	45	0.4	24	0.2	4	*	
	6	0.1	3	*	0	0.00	
DECEMBER	0	0.1					
YEAR	951	8.6	555	5.0	199	2.05	

¹ Includes subtropical storms after 1967. See Neumann et al.
 (1993) for details.
Less than 0.05

Years of maximum and minimum tropical cyclone activity appear in Table 11. Years of minimum activity are stratified to account for the effect of routine aerial reconnaissance, which began in 1944. This table shows that the greatest number of major hurricanes in one year was eight in 1950. The second most active year was 1961, with seven. Seventy percent of the years with the most hurricanes also had the most major hurricanes. Of course, there are many more years with no major hurricanes than with no hurricanes, although the preponderance of years prior to 1960 strongly suggests a detection problem because of lack of aerial reconnaissance and satellite information.

Table 11. Years of maximum and minimum tropical cyclone, hurricane, and major hurricane activity in the North Atlantic, Caribbean, and Gulf of Mexico, 1886-1996. Adapted from Hebert et al. (1997).

Number	Years	Number	Years	1	Number	Years	
21	1022	10					
19	1933 1995	12 11 1	1969	1005	8		
18	1969	_	.916,1950 .887,1893		7 6		1055
17	1887		955,1980		•	1916,1926 1964,1996	, 1955
		_	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,		1933,1951	. 1958
						1969,1995	,
TROPICAL	M CYCLONES ¹		CTIVITY			HURRICANES	
						TOTALLAMES	
Number	Years	Number	Years	N	umber	Years	
1	1890,1914	0	1907,19	14	0	1886,	
2	1925,1930	1 1	890,1905	,1919		1888-1892,	,
		_	1925			1897-1898,	,
			895,1897			1902,	
			917,1922	1930,		1904-1905,	
		1	931			1907,1911,	
						1913-1914,	
						1918,1920,	
						1925,1934,	
						1937,1940,	,
TROPICAL	CYCLONES ¹	HURI	CTIVITY (HURRICANES	
Number	Years	Number	Years	N	umber	Years	
		2	1982		0	1968,1972,	,
						1986,1994	
ı							

Another frequently asked question is: Are there hurricane cycles? Figures 3 through 12 show the plotted tracks of all category 4 and 5 hurricanes by decade. The portion of the track associated with a best-track wind speed of category 4 (115 kt) or greater is shown in bold.

Close examination of these plots will reveal one of the recognized deficiencies of this data set. That is, the six-hourly data often does not adequately describe the wind at landfall. This is simply because the time of landfall does not necessarily occur at 0, 6, 12 or 18 UTC. Taking Hurricane Hugo as an example (see Fig. 11, track number 10) the bolded portion of the track does not intersect the coastline, although winds at the time of landfall are estimated to have been of category 4 intensity. In examining the BTDF for Hugo, the final position associated with winds of category 4 or greater occurs at 0 UTC (winds of 120 kt). The next position at 6 UTC is inland, with winds of 85 kt. The data file in its present 6-hourly form does not contain the time of landfall, which would allow a more accurate depiction at landfall. In pointing out problems of this nature, it should be kept in mind that the original purpose of the data set was primarily to support a broad statistical analysis of tropical cyclone characteristics over the entire basin.

Each plotted track in Figs 3-12 is keyed to a table entry, found in the upper-right of each figure. These entries give the hurricane name (after 1949), the maximum wind attained and the accompanying central pressure, if known. Multiple entries for one hurricane indicate (as do the bold portion of the tracks) that the hurricane achieved category 4 intensity, or greater, then fell below the 115-kt threshold, and subsequently regained category 4 intensity. In cases where the duration of the maximum wind spreads over more than 6 hours, and is accompanied by two or more different pressures in the BTDF, the lowest pressure is listed in the table. Also note that dates are consistent with UTC, so that a day begins at 0 UTC (7 PM EST in the United States), rather than local midnight.

While the clustering of the tracks and the portions of the tracks associated with winds of category 4 or higher (Figs 3-12) is not as compelling as the depiction of landfalling major hurricanes by decades in Hebert et al. (Figs 1-10) (1997), there is here a sense of an ebb and flow of the category 4 and 5 hurricanes in relation to the the number of major hurricanes which were making landfall in the Gulf of Mexico versus the Florida peninsula and the Atlantic coast.

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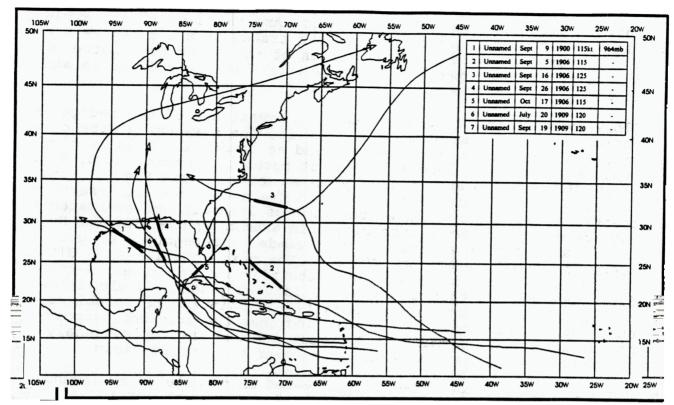


Figure 3. Hurricanes reaching at least category 4 intensity, 1900-1909. Bolded track segments indicate best-track wind speeds equal to or exceeding 115 kt.

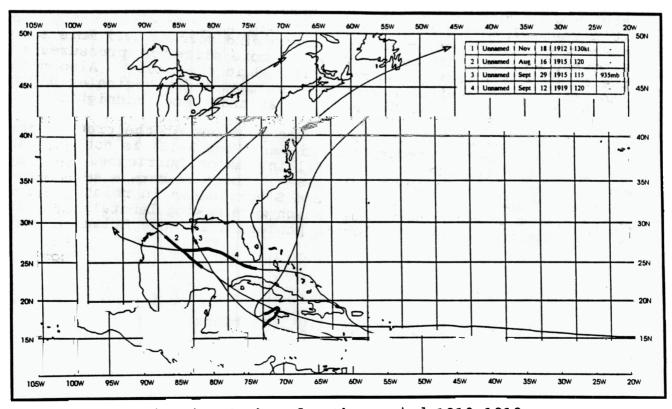


Figure 4. As in Fig. 3, but for the period 1910-1919.

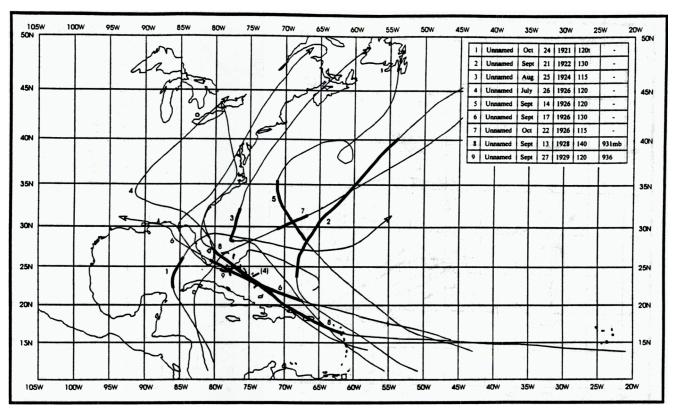


Figure 5. As in Fig. 3, but for the period 1920-1929. Note that bolded track of 1928 hurricane (labeled 8) obscures track of first hurricane of 1926 (labeled 4).

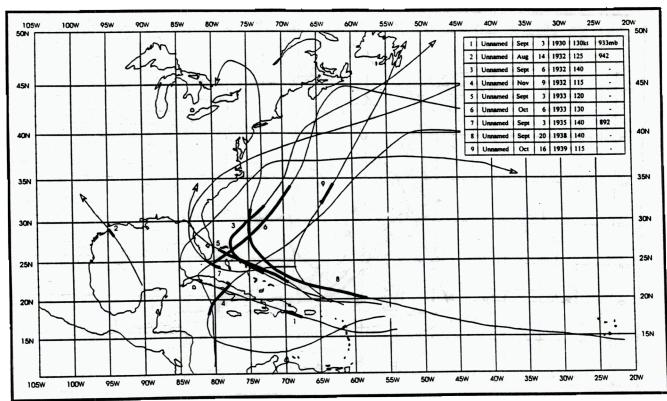


Figure 6. As in Fig. 3, but for the period 1930-1939

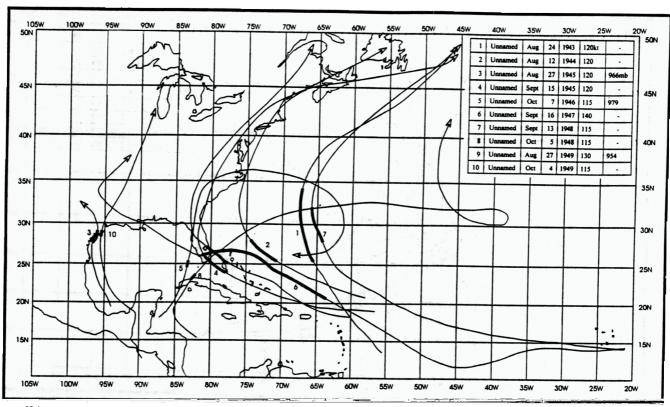


Figure 7. As in Fig. 3, but for the period 1940-1949

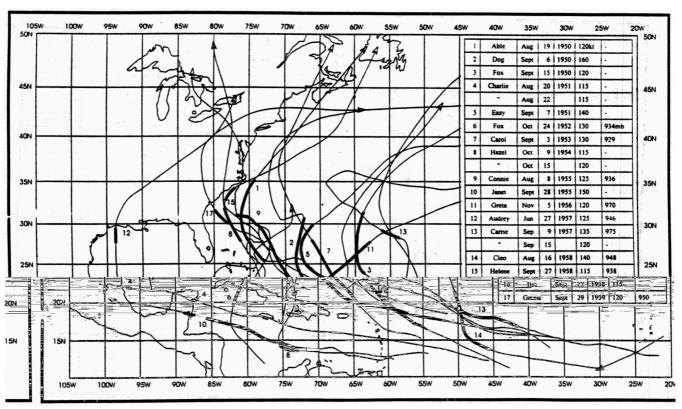


Figure 8. As in Fig 3, but for the period 1950-1959

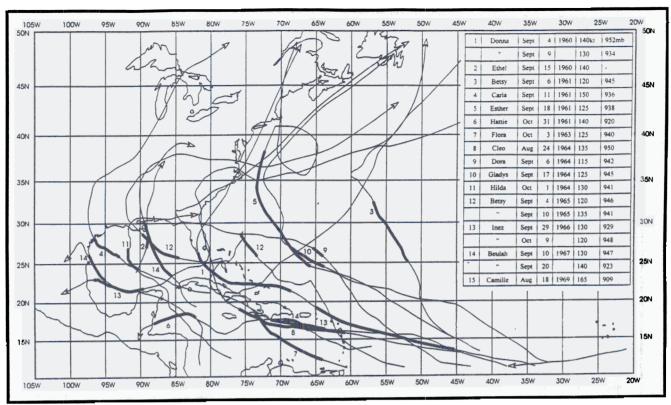


Figure As Fig but for the period 1960 1969

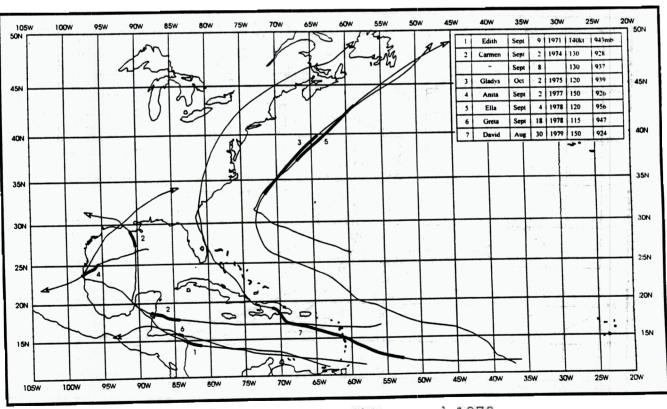


Figure Fig but for the period 1970

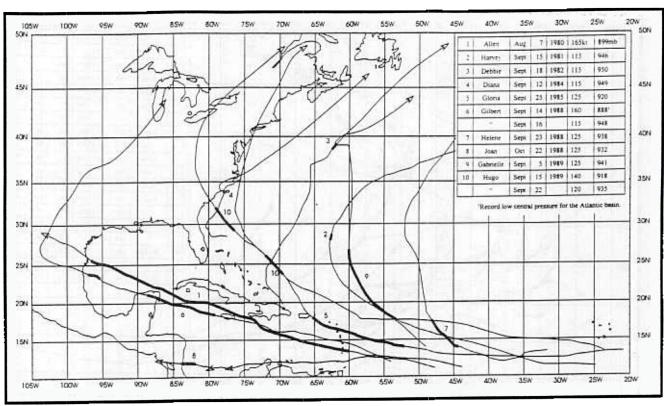


Figure 11. As in Fig. 3, but for the period 1980-1989

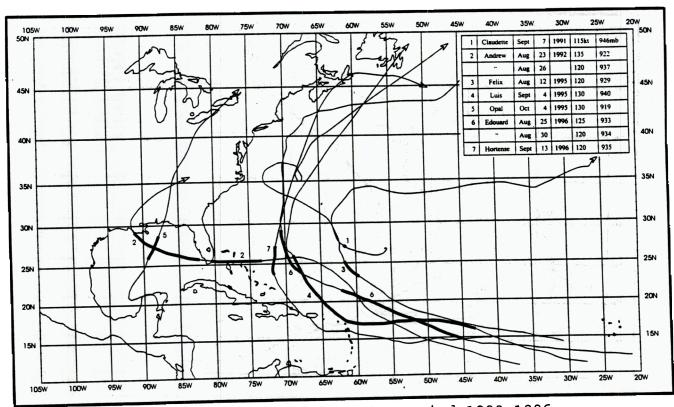


Figure 12. As in Fig. 3, but for the period 1990-1996.

Table 12 provides a further stratification by year of occurrence, and is analogous to Table 14 in Hebert et al. (1997). Major hurricanes and hurricanes of all categories are shown by individual years in each decade.

Table 12. Major hurricanes and all hurricanes by individual years Adapted from Hebert et al. (1997).

				Mai	or Hu	rrica	nes				
Decade	00	01	02	03	04	05	06	07	08	09	Total
1900-09	2	1		1			4			4	13
1910-19	3		1			3	6	2	1	1	16
1920-29		2	1	1	2		6	2	1	1	16
1930-39	1	1	4	5		3	1		1	1	17
1940-49		2	1	2	3	3	1	2	4	3	21
1950-59	8	5	3	4	2	6	2	2	5	2	39
1960-69	2	7	1	2	6	1	3	1		5	28
1970-79	2	1		1	2	3	2	1	2	2	16
1980-89	2	3	1	1	1	3		1	3	2	17
TOTAL	20	22	12	17	16	22	25	11	17	21	183

				Al	l Hur	rican	es				
Decade	00	01	02	03	04	05	06	07	08	09	Total
1 2 2 2 2 2	-		3	8	2	1	6		_	4	2 -
			4	3		4	11	2			
			2	3	5	1	8	4			
			6	10	6	5	7	3			
			4	5	7	5	3	5			
			6	6	8	9	4	3			
			3	7	6	4	7	6			
			3	4	4	6	6	5			
			2	3	5	7	4	3			
TOTAL	45	45	33	49	43	42	56	31	43	50	437

Figures 3 through 12 certainly suggest the existence of a cyclical migration of hurricane and major hurricane activity, and during preferred periods. Table 12 is also suggestive of preferred periods. The authors do not propose a physical mechanism for these spatial and temporal shifts, but merely point them out.

It should be stressed that even during relatively quiet years, devastating hurricanes can and do occur. A general lack of activity should never be taken as an excuse for failure to prepare.

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 list server: Mapinfo_L ftp archives, http://www.sni.net/gis
 /mapinfo/idx.html, keyword 'weather.'

Appendix A

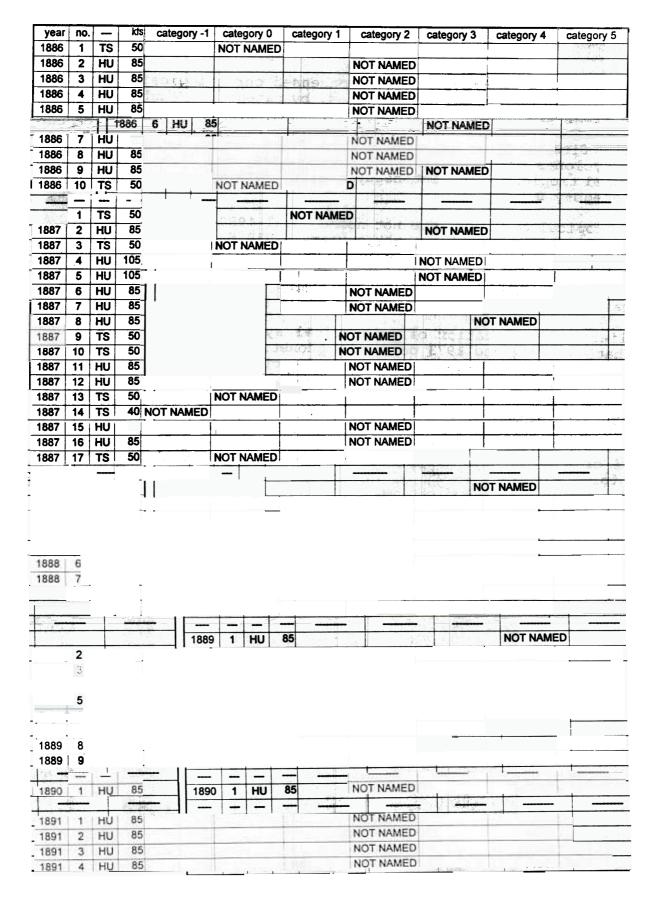
Appendix A is provided as a condensed chronological reference for North Atlantic tropical cyclones, by category. Wind speed in knots is the maximum given in the BTDF.

Taking the first year of record (1886) as an example, of the 10 tropical cyclones occurring during 1886, the first system of that year reached tropical storm intensity (TS) with maximum winds of 50 knots (category 0).

Atlantic tropical cyclones were not named until 1950. The phonetic alphabet was used for the first three years, 1950-52. In 1953, the practice of using female names was adopted, as had been done in the Western Pacific during World War II (Neumann, et al., 1993). This was modified to include both male and female names, on an alternating basis, in 1979.

As noted earlier, identification of subtropical systems began in 1967. Note that for 1972 and 1973 only, the phonetic alphabet was again used to name subtropical systems. All other years use 'subtrop1', 'subtrop2', etc. For years in which the count of subtropical systems appears to be discontinuous (e.g. 1976) it is because the intervening system (subtrop2) became tropical and was named.

For category 4 or 5 hurricanes (rightmost columns), refer to Figs. 3 through 12 for track plot.



year	-	-	kfs	caregory .	category 0	category 1	category 2	category 3	category 4	category 5
1891	5	HU	85				NOT NAMED		4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	9-11-0
1891	6	HU	85				NOT NAMED			
1891	7	TS	45	NOT NAMED						
1891	8	TS		NOT NAMED						
1891	9	HU	85	DESCRIPTION OF THE BEST OF THE			NOTHER			
1891	10		85				NOT NAMED		417 17 17 18	e i e e e
1031	10	HU	1000	L.			NOT NAMED		Carlos	
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1892	2	HU	85				NOT NAMED		1.50 2.1	1000
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1892	4	TS	50		NOT NAMED		0.0000000000000000000000000000000000000			
1892	5	HU	85				NOT NAMED			200
1892	6	TS	50		NOT NAMED		INOT INAMED			
1892	7	HU	85		NOT NAMED		11071111		1	\$ vit . · ·
		1	1. 17.11				NOT NAMED			
1892	8	TS	50		NOT NAMED					<u> </u>
	-		45	NOT NAMED	\$10					#F01
									*4	-4
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1893	2	HU	85		1 1 1 1		NOT NAMED	. Re-165.00		
1893	3	HU	105					NOT NAMED	777	1 1.1.12
1893	4	HU	85				NOT NAMED			Kent
1893	5	HU	85				NOT NAMED			
1893	6	HU	105				1401 TAMED	NOT NAMED		
1893	7	HU	85		-		NOTNAMED	NOT NAMED		433-4
							NOT NAMED		44 44	
1893	8	HU	85				NOT NAMED		1 1 14 1	Vi.
1893	9	HU	105					NOT NAMED		5 - White
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						+				
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1894	2	HU	85	3. 1874			NOT NAMED	-	3.54	5
1894	3	HU	105		+			NOT NAMED		
1894	4	HU	105		-			NOT NAMED		
1894		HU	85		+		NOT NAMED	HOT HAMED		
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1895 1895 1895 1895 1895 1896 1896 1896 1896	2 3 4 5 6 - 1 2 3 4	HU TS TS HU TS HU HU HU HU HU	85 50 105 35 85 105 85	NOT NAMED	NOT NAMED		NOT NAMED	NOT NAMED		\$20°
1895 1895 1895 1895 1895 1896 1896 1896 1896 1896	2 3 4 5 6 - 1 2 3 4 5 6	HU TS TS HU TS HU HU HU HU	85 50 50 105 35 85 105 85 105	NOT NAMED	NOT NAMED		NOT NAMED	NOT NAMED		
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1898	8	TS	50		NOT NAMED				Manager -	
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1899	2	HU	105		1000			NOT NAMED		The state of
1899	3	HU	105				Carrier Barrier	NOT NAMED		3/19
1899	4	HU	105					NOT NAMED	10000	
1899	5	TS	40	NOT NAMED		11				
1899	6	HU	85				NOT NAMED			
	_	_	-		Water College	Name of the last		To leave the	444	10000
1900	1	HU	115	Complete Company					NOT NAMED	
1900	2	HU	85		1975 10 10 11 11		NOT NAMED			
1900	3	TS		NOT NAMED						
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_	6			NOT NAMED	NOT NAMED					
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							NOT NAMED			4 600
1901	5	HU						NOT NAMED		
1901	6	TS	50		NOT NAMED					
1901	7	TS	40	NOT NAMED						
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1901	9	TS		NOT NAMED					1977 - 1987	
1901	10	TS	50	10.0.1 //	NOT NAMED					
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1902	1	TS	45	NOT NAMED				T T		
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1902	3	HU	85				NOT NAMED			
1902	4	HU	85				NOT NAMED			
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1903	2	HU	105					NOT NAMED		
1903	3	HU	85	1			NOT NAMED			
1903	4	HU	85				NOT NAMED			
1903	5	TS	50		NOT NAMED					
1903	6	HU	85				NOT NAMED		E. SHE	
1903	7	HU	85				NOT NAMED			
1903	8	HU	85				NOT NAMED			
1903	9	HU	85				NOT NAMED			Thurst
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1904	1	TS	60	ı	NOT NAMED					
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1904	3	HU	65			NOT NAMED				-
1904	4	TS	45	NOT NAMED			-		-	<u> </u>
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1905	1	TS	50		NOT NAMED			-		
1905	2	TS	50		NOT NAMED					
1905	3	TS		NOT NAMED	NOT NAMED					
1905			70					-	-	
	4	HU				NOT NAMED			1000	
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_										********
1906	1	TS		NOT NAMED						w/ 1
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1906	4	HU	125						NOT NAMED	
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1906	6	TS	60		NOT NAMED					
1906	7	HU	85				NOT NAMED	723334		
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1908	2	HU	85				NOT NAMED	DEC 174		\$ -
1908	3	TS		NOT NAMED						1
1908	4	HU	105					NOT NAMED		
1908	5	TS	60		NOT NAMED					
1908	6	HU	85				NOT NAMED	DOMESTIC IN		
1908	7	HU	70			NOT NAMED				12176
1908	8	TS	35	NOT NAMED						
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1909	1	TS	50		-			•		
1909	2	TS	45		NOT NAM	ED			e de la companya de l	1.19
1909	3	HU	120							NOT NA
1909	4	TS	50		NOT NAMED				I	
1909			105		TO I WHILE			NOT NAMED	-	
	5	HU			<u> </u>		 	INC. INC.		
1909	6	TS		NOT NAMED			<u> </u>		NOT NAMED	
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1909	8	TS		NOT NAMED				NOTALLE	 +	
1909	9	HU	105					NOT NAMED	1 1	
1909	10	TS	50		NOT NAMED	<u> </u>	,	1		
	_	'							<u> </u>	
1910	1	TS	50		NOT NAMED					
1910	2	HU	105			- 17 - N		NOT NAMED		
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year	no.	_	kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
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1921	1	HU	85				NOT NAMED			× 100 × 100
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1921	3	HU	105					NOT NAMED		
1921	4	TS	60		NOT NAMED			11011011120		
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		HU	120		NOT NAIVIED				NOTALAMED	
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	_		45						***************************************	
1922	1	TS		NOT NAMED						
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1922	3	TS		NOT NAMED					1	
1922	4	HU	85			1 44.1	NOT NAMED	The state of	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	-	_	-							
1923	1	HU	90				NOT NAMED	5		ě.kº
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		HU	85				NOT NAMED		A 185	
1923	4	TS	40	NOT NAMED						
1923	5	TS		NOT NAMED				179 - 144		
1923	6	TS	- 0.0	NOT NAMED				- 0	a	14.24.1
1923	7	TS	- 1	NOT NAMED				N. N.	St. 32.	1
1523	1	15	40	NOT NAMED						
			40	NOT MANES				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		7.2.2
1924	1	TS		NOT NAMED				1 1	NOT NAMED	
1924	2	HU	115		ļ			4.4	NOI NAMED	
1924	3	HU	90				NOT NAMED	8. 9.1 (100 cm)		185
1924	4	HU	70			NOT NAMED	⊌û.	44.53		7×3
1924	5	TS	45	NOT NAMED						1,891
1924	6	TS	50		NOT NAMED					1411
	7	HU	105					NOT NAMED		- 25.4
1924	8	HU	85	•		2 :	NOT NAMED	19	11 14	
	_	_	_							
1925	1	TS	40	NOT NAMED						976
1925	2	HU	85		V		NOT NAMED			
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1926	1	HU	120						NOT NAMED	•
1926	2	HU	105					NOT NAMED		
1926	3	HU	90				NOT NAMED	3		- 1 Et - 1
2007/2006	4		120						NOT NAMED	
1926	-	HU	90				NOT NAMED			
1926	5		130						NOT NAMED	
1926	6	HU		NOTHING						
1926	7	TS		NOT NAMED		AL L		NOT NAMED		
1926	8	HU	105					HOT HOWED		
1926	9	TS		NOT NAMED					NOT NAMED	A 34 4 4 4
1926	10	HU	115			100			NOT NAMED	8-1
1926	11	TS	35	NOT NAMED						
		_				+	•			
1927	1	HU	105	:				NOT NAMED		. Faries 1
1927	2	HU	90				NOT NAMED	P	+	+
1927	3	HU	70			NOT NAMED				
1927	4	HU	105		1	-		NOT NAMED		
1927	5	TS	50		NOT NAMED)	1			
200000	6	TS	1 - 1	NOT NAMED		1	-1		•	
1027	- 17	10	7.0		_	-	•	10 10 10 10 10 10 10 10 10 10 10 10 10 1	31 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
1927 1927	7	TS	AF	NOT NAMED)	1	i		N 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Application of the second

year	no.	_	kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1928	1	HU	85				NOT NAMED	catego., c	category .	70.195.75
1928	2	HU	70			NOT NAMED				
1928	3	TS	50		NOT NAMED	ITOT TO WILL		V V		1
1928	4	HU	140		1 2 2			75.7		NOT NAMED
1928	5	TS	50		NOT NAMED				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	140114.44.2
1928	6	HU	70		7	NOT NAMED				
	_									
1929	1	HU	75			NOT NAMED				
1929	2	HU	120			TOT TOTALLE			NOT NAMED	
1929	3	HU	80			NOT NAMED			NOT NAMED	
1323	3	no	-00	Jacobson I	PERMISTRO T	NOT NAMED	250.0 mm.	-0.01100a	NAME OF THE OWNER.	- Parish to
1930	1	HU	95	51.		THE BOOK THE	NOT NAMED	7		
1930	2	HU	130	- A			NOT NAMED		NOT NAMED	
1930		-	130					See	HOT HANGED	3
1931	1	TS	40	NOT NAMED	970					
1931	2	TS	50	NOT NAMED	NOT NAMED	· · · · · · · · · · · · · · · · · · ·	4 1 4			
1931	3	TS	50		NOT NAMED					2.0
1931	4	TS		NOT NAMED	HOT NAMED					
1931	5	HU	110	HOT HANGED				NOT NAMED		7 7 7 9
1931	6	HU	85				NOT NAMED	NOT INAMED		<u> </u>
1931	7	TS	100	NOT NAMED			NOT NAMED			
	8	TS	100.00	NOT NAMED						
1931				NOT NAMED					****	
1931	9	TS	40	NOT NAMED						
_	-	-	7,		**********			-20	(2000)	33100000
1932	1	TS	-	NOT NAMED					NOTAMED	
1932	2	HU	125					1,2	NOT NAMED	
1932	3	HU	70			NOT NAMED				NOT NAMED
1932	4	HU	140							NOT NAMED
1932	5	TS		NOT NAMED			13 18 11 2 12 1			
1932	6	TS		NOT NAMED				NOT NAMED		
1932	7	HU	105					NOTNAMED		
1932	8	TS		NOT NAMED		V		astronomics		
1932	9	TS	and the second	NOT NAMED		ž			NOT NAMED	
1932	10	HU	115				NOTHANED		NOT NAMED	
1932	11	HU	85		-		NOT NAMED			1
1933	1	TS		NOT NAMED			NOTHINED			
1933	2	HU	90			LI.	NOT NAMED		- F10	
1933	3	TS		NOT NAMED						
1933	4	TS		NOT NAMED		NOT NAMES	- : :			
1933	5	HU	80		NOTALATED	NOT NAMED				
1933	6	TS	50		NOT NAMED					
1933	7	TS	35					NOT NAMED		
1933	8	HU	105		1			NOT NAMED		
1933	9	TS		NOT NAMED					+	
1933	10	TS		NOT NAMED				NOT NAMED	1	
1933	11	HU	110					NOT NAMED	NOT NAMED	
1933	12	HU	120					NOT NAMED		
1933	13	HU	105			NOTALLE		NOT NAME	,	
1933	14	HU	75			NOT NAMED				
1933	15	HU	95				NOT NAMED			
1933	16	TS		NOT NAMED						
1933	17	TS	1	NOT NAMED)				NOT NAME	3
1933	18	HU	130						NOT NAME	
1933	19	HU	85				NOT NAMED)		

year	no.	-	kts		category 0	category 1	category 2	category 3	category 4	category 5
1933	20	TS	60	1	NOT NAMED				J., .	
1933	21	TS	35	NOT NAMED			1944			
	-	-	-						*******	
1934	1	TS	50		NOT NAMED				1.4	
1934	2	HU	70			NOT NAMED				1 1 1 1 1
1934	3	HU	65			NOT NAMED	1			
	-	TS	35	NOT NAMED				· · · · · · · · · · · · · · · · · · ·		
	+	2 44-07	70			NOT NAMED			6	
1934	6	HU	85				NOT NAMED			
1934	7	TS	40	NOT NAMED						1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
1934	8	HU	85			7723447	NOT NAMED			3 1 1
1934	9	TS	50		NOT NAMED	7.4			 	
1934	10	TS	100	NOT NAMED			12,1			V ALM
1934	11	HU	75			NOT NAMED				
_	_									
1935	1	HU	105		+			NOT NAMED		
1935	2	HU	140		- N			. TO I TANKED		NOT NAMED
1935	3	TS		NOT NAMED				V CONTRACTOR		1401 NAIVIEL
1935	4	HU	105	INAMED				NOT NAMED		
1935	5	HU	75		4.4.4	NOT NAMED	*	10 1 GAMED		
1935	6	HU	70			NOT NAMED			- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	***
1900	-	110			F	HOT HANED				
1936	1	TS	40	NOT NAMED						*
1936	2	TS		NOT NAMED	1					8
1936	3	HU	70	HOT HAINED		NOT NAMED			4	A 142 1
1936	4	TS	W	NOT NAMED	<u> </u>	NOT NAMED	74			en co
		HU	80	NOT INAMED	··.	NOT NAMED	. /			25.
1936 1936	5	TS	-	NOT NAMED		NOT NAMED				
	7	TS		NOT NAMED					0.84 	2 30 11
1936		HU	70	NOT NAMED		NOT NAMED				West No.
1936	8	TS	inc.	NOT NAMED		NOT NAMED				
1936	9		70	NOT NAMED		NOT NAMED				2 2 4 3 2 2
1936	10	HU	95			NOT NAMED	NOT MARED		***	0 21
1936	11	HU		NOT MANES			NOT NAMED		- 1 - 1 - 1 - 1 - 1	THE !
1936	12	TS		NOT NAMED	**************************************			NOT NAMED		3 714
1936	13	HU	105	NOTHINED				NOT NAMED	<u> 10 10 1</u>	11 12 0
1936	14	TS	95	NOT NAMED		141	NOT NAMED			
1936	15	HU	122	NOT NAMED		¥	NOT NAMED			S-5-1
1936	16	TS	35	NOT NAMED						
4007	_				NOT NAMES					
1937	1	TS	60		NOT NAMED			Same in the		3 23
1937	2	TS	50		NOT NAMED					1 5/2/4
1937	3	TS	50		NOT NAMED		NOT NAMES		4.5 ⁴ c	3.00
1937	4	HU	85			***	NOT NAMED			6.54
1937	5	HU	95	NOT HAVE			NOT NAMED		- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
1937	6	TS		NOT NAMED			NOT NAMES			l nar l
1937	7	HU	85				NOT NAMED	Bayers M.		
1937	8	TS		NOT NAMED						-
1937	9	TS	35	NOT NAMED				-	174 S. 184	2.0
	-		_							+
1938	1	TS	60		NOT NAMED	1 3 10 250 1	1		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	3,6-2
1938	2	HU	85				NOT NAMED			
1938	3	HU	85			-	NOT NAMED	7	17. a.t.	NOT MALE
1938	4	HU	140		<u> </u>		+	-		NOT NAME
1938	5	TS	50		NOT NAMED				and the second	1 2 2 1 - 2 2
1938	6	TS	40	NOT NAMED)					

year	no.		KIS		category 0	category 1	category 2	category 3	category 4	category 5
1938	7	TS	40	NOT NAMED				3,1,1	200000000000000000000000000000000000000	- July U
1938	8	TS	60		NOT NAMED					
	-	-	-			-				
1939	1	TS	45	NOT NAMED			2011007	TOTAL STATE OF		
1939	2	HU	70			NOT NAMED				
1939	3	TS	112	NOT NAMED		NOT NAMED			100	
1939	4	HU	115							
1939	5	HU	80			NOTHINE			NOT NAMED	
1000	-	110	00		7, 19	NOT NAMED	1	 		
1940	1	TS	50		NOT NAMED					
1940	2	HU	70	<u></u>	NOT NAMED	2107 1111	<u> </u>	25 1 5 1		-
1940	3	HU	80			NOT NAMED			,	
						NOT NAMED			-	
1940	4	HU	70			NOT NAMED				
1940	5	HU	85			1	NOT NAMED		March 1 sec	4.1
1940	6	TS	_	NOT NAMED						
1940	7	TS	_	NOT NAMED					4.2	
1940	8	TS	40	NOT NAMED						
	-	***				-		- AND -	-	E-WAVE
1941	1	TS	40	NOT NAMED		- V - U				
1941	2	HU	80			NOT NAMED				
1941	3	HU	70			NOT NAMED				
1941	4	HU	105	30.00				NOT NAMED		
1941	5	HU	105					NOT NAMED		
1941	6	TS	45	NOT NAMED						
_	_	_				described a	Carrie	-	Yanania I	and the same
1942	1	HU	70		20/0/11/2	NOT NAMED				
1942	100	HU	100			NOT MAINLE		NOT NAMED		
1942	200	HU	95				NOT NAMED	NOT NAMED		
1942	4	TS		NOT NAMED		1	NOT NAMED			
1942	5	TS		NOT NAMED			i			
1942	6	TS		NOT NAMED						
1942	7	TS	50		NOT NAMED			<u> </u>	-	
1942	8	TS	l.	NOT NAMED	NO! NAMED					
1942	9	TS		NOT NAMED				September		
1942	10	HU	85				NOT NAMED			
	-	-							 -	
1943	1	HU	75			NOT NAMED		_		
1943	2	TS	50		NOT NAMED					
1943	3	HU	120						NOT NAMED	
1943	4	ΗU	105	henke M	A constant and the	in Little	70.466	NOT NAMED		
1943	5	TS		NOT NAMED						
1943	6	HU	85	and a state of the	A company of the company of	and the state of t	NOT NAMED	100 KV		1 - 1
1943	7	TS	50		NOT NAMED		and the second			
1943	8	TS	60	PCTs to decise a south	NOT NAMED	and and the same of the same	to the second second		1	
1943	9	HU	95	4.7			NOT NAMED			
1943	10	TS	40	NOT NAMED	20.20				1/2	
1 1/2 1 1 1 1 1 1 1 1 1						to the state of the	lekinudyhere	1		
	1	HU	80	The state of the last of the l		NOT NAMED		AND ACCORDED AND ACCORDING		
1944		_		4.77	NOT NAMED					
1944			-		1.01	NOT NAMED	to explicate the control	1		
100		LHI t	RN					1	1	
1944	3	HU	80 105	Maria of the MidWooders	111111111111111111111111111111111111111			NOT NAMED		
1944 1944	3 4	HU	105		NOT NAMED			NOT NAMED		
1944 1944 1944	3 4 5	HU TS	105 50	Name of the Address	NOT NAMED			NOT NAMED		
1944 1944	3 4	HU	105 50	NOT NAMED				NOT NAMED	NOT NAMED	

HU TS TS TS HU TS HU TS TS TS HU TS	105 105 100 45 50 60 120	NOT NAMED			category 2 NOT NAMED	NOT NAMED NOT NAMED		category 5
TS T	40 105 100 45 50 120 50 120 50 120 85	NOT NAMED	NOT NAMED		NOT NAMED	NOT NAMED		
HU TS TS TS HU TS TS HU TS HU	105 100 45 50 60 120 50 35 50 120 85	NOT NAMED	NOT NAMED					
HU TS TS TS HU TS TS HU TS HU HU TS	100 45 50 60 120 50 35 50 120 85	NOT NAMED	NOT NAMED					
TS TS HU TS TS HU TS TS HU HU TS	45 50 60 120 50 35 50 120 85	NOT NAMED	NOT NAMED			NOT NAMED		
TS TS HU TS TS HU TS TS HU HU TS	45 50 60 120 50 35 50 120 85	NOT NAMED	NOT NAMED			NOT NAMED		
TS TS HU TS TS HU HU HU TS	50 60 120 50 35 50 120 85		NOT NAMED					
TS HU TS TS HU HU TS HU TS	50 35 50 120 85		NOT NAMED					1
HU TS TS TS HU HU TS	120 50 35 50 120 85							A Secretary
TS TS HU HU TS HU TS	50 35 50 120 85		NOT NAMED					
TS TS HU HU TS HU TS	35 50 120 85	i i	NOT NAMED				NOT NAMED	
TS HU HU TS HU	50 120 85	NOT NAMED	No. 1 Vital	L	Jan Jan			1750
HU HU TS HU TS	120 85		Li e					2 2 3 4 4
TS HU	85		NOT NAMED				141	
TS HU	1						NOT NAMED	De Ger
HU	85				NOT NAMED			NAME OF THE PARTY
HU				2.60	NOT NAMED			
HU								+
TS	35	NOT NAMED					1 7 7 7 7 7	7 7 1
TS	70			NOT NAMED	4-4			
	Lancie Control	NOT NAMED					7.14	3.5
HU	85				NOT NAMED			
HU	115						NOT NAMED	
TS	1 -1	NOT NAMED	 				NOT TO MILED	3.5.4
+=			·					354.3
TS	40	NOT NAMED						77767
HU	95	HOT HANED		4 . 0.940	NOT NAMED		<u> </u>	3
	70			NOT MANED	NOT NAMED			7 7 Nov.
HU			-	NOT NAMED			tah diaku	NOT NAMED
HU	140							NOT NAMED
	-					<u> </u>	1.34	Page
	7.7		NOT NAMED		<u> </u>			
_		NOT NAMED					C 111	
_								
HU	105			19/1/1		NOT NAMED	14-4	N. T. Section
-							**********	
								1.75
TS		NOT NAMED					War.	
HU	1					NOT NAMED		* 2
TS	50		NOT NAMED					
HU	70			NOT NAMED				
HU	115						NOT NAMED	
HU	105					NOT NAMED		
HU	115						NOT NAMED	e May
HU	70			NOT NAMED	T STREET G		1,31	27.
1-	_							- चीन-
HU	95			.4. ·	NOT NAMED			S. A. Brasilia
							NOT NAMED	
					CHEATTE.			
			1	<u> </u>		NOT NAMED	> **	
	1	the second secon		and the state of the state of				
						and the same of th		78.00
				 		4.54		55
			HOT HANGED	A	NOT NAMED			
	1	1 1 1 1		NOT NAMES		 	+	
1 4.00	1			INUI NAME		1 44. W. J. C.		1-1
	775		 			1000		11
HU					NOT NAMED		NOT NAMED	
	HU HU HU HU TS HU TS TS HU HU	TS 50 TS 45 HU 75 HU 105 TS 45 TS 35 HU 105 TS 50 HU 70 HU 115 HU 105 HU 115 HU 105 HU 115 HU 115 HU 70 TS 45 HU 70 HU 115 HU 70 TS 45 HU 130 TS 45 HU 110 TS 40 TS 40 TS 50 HU 85	TS 50 TS 45 NOT NAMED HU 75 HU 105	TS 50 NOT NAMED HU 75 HU 105 TS 45 NOT NAMED TS 35 NOT NAMED TS 35 NOT NAMED HU 105 TS 50 NOT NAMED HU 105 HU 105 HU 115 HU 105 HU 115 HU 105 HU 115 HU 100 TS 45 NOT NAMED HU 115 HU 115 HU 110 TS 40 NOT NAMED TS 40 NOT NAMED TS 40 NOT NAMED TS 50 NOT NAMED HU 110 TS 40 NOT NAMED TS 50 NOT NAMED TS 50 NOT NAMED TS 50 NOT NAMED	TS	TS	TS 50 NOT NAMED HU 75 NOT NAMED HU 105 NOT NAMED TS 45 NOT NAMED TS 35 NOT NAMED HU 105 NOT NAMED TS 50 NOT NAMED HU 70 NOT NAMED HU 115 NOT NAMED HU 115 NOT NAMED HU 105 NOT NAMED HU 115 NOT NAMED HU 115 NOT NAMED HU 110 NOT NAMED HU 110 NOT NAMED HU 130 NOT NAMED HU 15 NOT NAMED TS 45 NOT NAMED TS 40 NOT NAMED TS 40 NOT NAMED	TS 50 NOT NAMED HU 75 NOT NAMED HU 105 NOT NAMED TS 45 NOT NAMED TS 35 NOT NAMED HU 105 NOT NAMED TS 50 NOT NAMED HU 70 NOT NAMED HU 115 NOT NAMED HU 115 NOT NAMED HU 105 NOT NAMED HU 115 NOT NAMED HU 110 NOT NAMED TS 45 NOT NAMED HU 130 NOT NAMED TS 45 NOT NAMED TS 45 NOT NAMED TS 45 NOT NAMED TS 40 NOT NAMED TS 40 NOT NAMED TS 50 NOT NAMED TS 50 NOT NAMED

year	по,	-	kts		category 0	category 1	category 2	category 3	category 4	category 5
1949	13	TS	50		NOT NAMED				200	3-17
-	-	-			-			-	-	1
1950	1	HU	120						ABLE	
1950	2	HU	105					BAKER	Apre	
1950	3	HU	100		1/4			CHARLIE		
1950	4	HU	160					CHARLIE		000
1950	5	HU	110					FARY		DOG
1950	6	HU	120					EASY	FOW	
1950	7	HU	95				OFFICE		FOX	
1950	8	TS	50		HOIN		GEORGE			
and the later of t	3.55	THE RESERVE OF THE RE	95		HOW		10000			
1950	9	HU	- ATC 28				ITEM			
1950	10	HU	105					JIG		
1950	11	HU	105					KING		
1950	12	TS	60		NOT NAMED					
1950	13	HU	80			LOVE				
-							*******	-		*********
1951	1	HU	100					ABLE		
1951	2	TS	50		BAKER					
1951	3	HU	115						CHARLIE	
1951	4	HU	100	54				DOG		
1951	5	HU	140							EASY
1951	6	HU	100					FOX		LISTOTO C
1951	7	TS	50		GEORGE			- Vone		
1951	8	HU	95		1270		HOW			
1951	9	HU	70		0.79	ITEM				
1951	10	HU	70			JIG				
	-	-	-					SWIII COL		
1952		TS		NOT NAMED				-		
1952	2	HU	90	NO! NAMED			ABLE			
1952		HU	105				ABLE	DAVED		
	3		105					BAKER		
1952		HU				200		CHARLIE		
1952		HU	75			DOG	-1011			
1952		HU	95				EASY			
1952	7	HU	130						FOX	
	***	-	-				-	(********		
1953	1	TS	60		ALICE		III-anazara			
1953	2	HU	95				BARBARA			
1953	3	TS	50		NOT NAMED		The said			
1953	4	HU	130						CAROL	
1953	5	HU	100					DOLLY		
1953	6	HU	110					EDNA		
1953	7	TS	60		NOT NAMED				1000	
1953	8	HU	110		and the same of th			FLORENCE		
1953	9	HU	70			GAIL				
1953	10	TS		NOT NAMED	1000	That Every				
1953	11	TS	60		NOT NAMED					
1953	12	TS	60		HAZEL					
1953	13	TS		NO! NAMED						
1953		TS	101	NOT NAMED						
17567155	14	1	-		CONTROL	54100	SALEME	2		Salloune-
	-		70		*********	ALIOF				-
1954	1	HU	70		N 11-11	ALICE				
1954	2	TS	40	District Control of the Control of t			0.000			
1954	3	HU	85				CAROL			
1954	4	HU	85				DOLLY			
1954	5	HU	105					EDNA		10

1954 1954 1954 1954 1954 1	6 H	- Ki		category 0	category 1	category 2	catego	ory 3	category	4 C2	tegory 5
1954 1 1954 1 1954 1	- 1	U 65	1		FLORENC					-	-34.7
1954 1 1954 1 1954 1		S 60	1	GILDA							
1954 1 1954 1	8 H	U 85	I			NOT NAMED					<u> </u>
1954 1	9 H	U 120					1		HAZEL		
	0 T	S 45	NOT NAMED		+		+		HAZEL		1
	1 H			11.7	ALICE	LiF.	+			-	+
1055	994		-		ALIOLE						ł
1933	1 T	SI		50	T RE	ENDA		-		-	
1955 2						323 (25) (-	. 7.			C
1955 3	-			<u> </u>						DIANE	- 0
CELES OF	Н	and the second						EDIT		DIANE	-
1955 5		200		NOTA	IAMED			EUII			
1955 6				NOTE	MINIED			FI 05			
1955 7		-			01.45340			FLOF	KA		
					GLADYS						
1955 8							HILD				
1955 9		1			[!	ION	E			
1955 10					,						
1955 1	. 1			NOT NAMED		.	L				
1955 12	2 HI	100					KAT	IE			
	- -							-			
1956 1	1	1 1		NOT NAMED		1			-	_	•
1956 2	H		_		ANNA						
1956 3	HL	105	-			1	BETS	SY			
1956 4	TS	45	CARLA				-	-			
1956 5	TS	60		DORA				_			
1956 6	TS	60		-							
1956 7					FLOSSY						•
1956 8											
						+				-	
1957 1	TS	55		NOT NAMED	· · · · · · · · · · · · · · · · · · ·	-	<u> </u>				
1957 . 2				1401 IANMED		 			AUDREY	,	
1957 2			-	BERTHA		 			AUDRET		
		_11		DEKTHA		 			CARRIE		
1957 4						· · ·			CARRIE		
957 5	TS	35	DEBBIE		_						
1957			6 TS						of the cost		<i></i>
					FRIEDA	-	- I to payment			i	· · · · · · · · · · · · · · · · · · ·
][1		NOT NAMED			- Hayya ta			<u>,</u>	
			<u> </u>								
1958 1			ALMA								
958 2				BECKY		4	L				
								T			CLEO
958 3	H						DAIS				
	H	100					ELL	Α			
1958 4			private de grande de	************************************	FIFI						
1958 4				GERDA	Ī.	1	1			1	er Seef a
1958 4 1958 5 1958 6	T:		·		-	<u> </u>	1	1 500 1	HELENE		34)
1958 4 1958 5 1958 6 1958 7	_	J 115			 		 		ILSA		
1958 4 1958 5 1958 6	H				1		l .		ILOM		

year	no.		KTS	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1959	7	HU	65			FLORA		caregory c	outogory .	category o
1959	8	HU	120						GRACIE	
1959	9	HU	110					HANNAH	OIVIOIL	
1959	10	TS	50		IRENE			11231412311		-
1959	11	HU	70			JUDITH				
						300/111				
1960	1	TS	40	NOT NAMED	1		**********			*******
1960	2	HU	85	NOT NAMED			4001/			
1960	3	TS	50		DDENDA		ABBY			
	4		80		BRENDA					
1960		HU	140		-	CLEO				
1960	5	HU								DONNA
1960	6	HU	140							ETHEL
1960	7	TS	40	FLORENCE					1 L	1 4 2 7 8 B
	-		-		-	2				A CONTRACT
1961	1	HU	100					ANNA		
1961	2	HU	120						BETSY	
1961	3	HU	150							CARLA
1961	4	HU	105					DEBBIE		
1961	5	HU	125						ESTHER	
1961	6	TS	35	NOT NAMED						
1961	7	HU	110					FRANCES		
1961	8	TS	60		GERDA					
1961	9	HU	140							HATTIE
1961	10	HU	70			JENNY				1.400,004
1961	11	TS	60		INGA	9211111				
	_		_							
1962	1	HU	85				ALMA			
1962	2	TS	35	BECKY			VEINIV			-
1962	3	TS	60	BECKI	CELIA					
	-	HU	95		CELIA		DAIGY			
1962	4		100				DAISY			
1962	5	HU	100					ELLA		

1963	1	HU	90				ARLENE			
1963	2	HU	105]		BEULAH		
1963	3	TS	50		NOT NAMED					
1963	4	HU	70			CINDY				
1963	5	HU	65			DEBRA				
1963	6	HU	85				EDITH			
1963	7	HU	125						FLORA	
1963	8	HU	95				GINNY			
1963	9	TS	45	HELENA						
-		-	-							-
1964	1	TS	50		NOT NAMED					
1964	2	TS	45	NOT NAMED						
1964	3	TS	55		ABBY					
1964	4	TS	45	BRENDA	2,44,521					
1964	5	HU	135						CLEO	
1964	6	HU	115						DORA	
1964	7	HU	100					ETHEL		
1510 150 150		-		FLORENCE				E I I I I I		
1964	8	TS	100	FLORENCE					GLADYS	_
1964	9	HU	125						HILDA	_
1964	10	HU	130					ICPTII	HILDA	
1964	11	HU	110					ISBELL		
1964	12	TS	35	NOT NAMED						
	-									

year	no.		kts		category 0	category 1	category 2	category 3	category 4	category 5
1965	1	TS	45	NOT NAMED	3.7					
1965	2	HU	80			ANNA				.67(2)
1965	3	HU	135			27.1	1 25	1.12	BETSY	
1965	4	HU	85		34.	- 90	CAROL			- A. H.
1965	5	TS	45	DEBBIE					 	2 11
1965	6	HU	70			ELENA				
	_									
1966	1	HU	110					ALMA		
1966	2	HU	65	<u> </u>						-
1966	3	HU	70		2.5	CELIA			2 2.	
						DOROTHY			5	
1966	5	TS	45	ELLA						
1966	6	HU	110			5.		FAITH	+	
1966	7	TS	50		GRETA			17,1111		
1966	8	TS	45	HALLIE	OKLIA					
1966	9	HU	130	TIALLIE					INEZ	
	10	TS	45	JUDITH				2	INEL	A ****
1966	11	HU	70	JUDITH		LOIS		-		
1966			, 0			LUIS				1/2/1
4007	-		75			ADIENE				
1967	1	HU	75			ARLENE				BEULAH
1967	2	HU	140				OULOF			DEULAN
1967	3	HU	95			505:	CHLOE	, ja	t eve	
1967	4	HU	75			DORIA	(Je ()			
1967	5	TS	50		EDITH					
1967	6	HU	75			FERN				
1967	7	TS	45	GINGER	*		line 1	- 12		
1967	8	HU	80			HEIDI				
	_	_							********	
1968		HU	65			ABBY				
1968	2	HU	65			BRENDA				
1968	3	TS	60		CANDY	J. 15. 14.				
1968	4	HU	70			DOLLY			A.1	X 22 1
1968	5	TS	55		EDNA				3	
1968	6	HU	70		1.00	SUBTROP 1	484		, age	. 1
1968	7	TS	50		FRANCES	. 4		08/4		
1968	8	HU	75			GLADYS	13.1			48
						A				
1969	1	TS	60		ANNA		10.1			Contract Annual Contract Annua
1969	2	HU	75			BLANCHE	*1			200
1969	3	HU	165							CAMILLE
1969	4	HU	105					DEBBIE	•	
1969	5	TS	50		EVE				Sat Hilliam	
1969	6	HU	100					FRANCELIA		
1969	7	HU	110					GERDA		N. W. Carlo
1969	8	HU	75			HOLLY		11 11 14 11		25.47
1969	9	HU	100				and the same	INGA		Table 1
	_	HU	65			NOT NAMED	14.			
1969	10	TS	60		NOT NAMED					A.C.
1969	11		50		SUBTROP 1	(2000)		+	1	-
1969	12	TS			SUBTROFT	3.24		-		-
1969	13	TS	40		170	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	KARA			13 mm
1969	14	HU	90		1.4		LAURIE			*****
1969	15	HU	90	1	NOT MANES		LAUNE		-	
1969	16	TS	60	1	NOT NAMED	The state of the s			-	
1969	17	HU	65			NOT NAMED		8	1	4 112
1969	18	HU	80)		MARTHA				

year	no.	-	kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
	-	_	_					***********		
1970	1	HU	70			ALMA			111	
1970	2	TS	55		BECKY				4	Zinan i
1970	3	HU	110					CELIA		
1970	4	TS	60	184	NOT NAMED					7
1970	5	TS	60		DOROTHY	e de la companya de l				<i>3</i>
1970	6	HU	110		· market in the control of the contr			ELLA	1.	
1970	7	TS	60		FELICE			-		17 124 7
1970	8	TS	45	GRETA				***************************************		er Wear
1970	9	HU	90			지 : 1	NOT NAMED			
1970	10	HU	65			NOT NAMED				1 1 1 2 1
		-	_							
1971	1	TS	55	14.5	ARLENE					The state of the s
1971	2	HU	75			NOT NAMED	3,44,51			
1971	3	HU	75			BETH				vi tali.
1971	4	TS	55		CHLOE					
1971	5	TS	55		DORIA			+1		4.71
1971	6	HU	140					<u> </u>	To gardina de la compa	EDITH
1971	7	HU	80		no contraction for	FERN				一
1971	8	HU	95				GINGER			
1971	9	TS	55		HEIDI					
1971	10	HU	70			IRENE		7.10		
1971	11	TS	55		JANICE	WELVE.		- 40		298
1971	12	TS	45	KRISTY	0, 11102	9				
1971	13	TS	60	KKIOTT	LAURA					
13/1		.5			LAOIVA					
1972	1	TS	60		ALPHA					
1972	2	HU	75		ALFIIA	AGNES				
100000000000000000000000000000000000000	***	HU	90			AGNES	BETTY			
1972	3		60		CARRIE		DEIII			1 100 f
1972	4	TS	70		CARRIE	DAWN				
1972	5	HU			OLIA DI UE	DAVVN			1.4	- All I
1972	6	TS	55	DE: T4	CHARLIE					
1972	7	TS	40	DELTA						na a na a na a na an
		-			Seminary.	The state of the s	1023000			
1973	1	HU	80			ALICE				
1973	2	TS	40	ALFA		PDENDA				
1973	3	HU	80		OUDIOTIVE	BRENDA				
1973	4	TS	60		CHRISTINE					
1973	5	TS	60		DELIA	8		ELLEN		- 61
1973	6	HU	100	26		FDATE		ELLEN		
1973	7	HU	70			FRAN		· · · · · · · · · · · · · · · · · · ·		
1973	8	TS	60		GILDA		37.4			
-		Cont. In	-							
1974	1	TS	55		SUBTROP 1					2004
1974	2	TS		SUBTROP 2		4 11			19 30 30 1	
1974	3	TS	50		SUBTROP 3					
1974	4	TS	55		ALMA				1 1 1 1 1 1 1	
1974	5	HU	100				Andrew 1916	BECKY		1
1974	6	HU	130				1		CARMEN	1
1974	7	TS	45	DOLLY		AL TON		27.5%		
1974	8	TS	60	ja in	ELAINE					
1974	9	HU	95				FIFI	14-6-16 27-29		
1974			65			GERTRUDE	10 A. C. S. C.	-		
1974			45	SUBTROP 4		1111				
	12.0	†=	0.7~297							

year	no.	****	kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1975	1	TS	60		AMY				AL PURE	
1975		HU	75			BLANCHE				
1975	3	HU	100					CAROLINE	910 100	
1975	4	HU	95				DORIS			
1975	5	HU	110					ELOISE		100
1975	6	HU	90				FAYE	- PET TY	10E0	
1975	7	HU	120			the extra			GLADYS	- 140
				HALLIE				and the same of		
					SUBTROP 2	100 100			The said	To ball
			-		30.5050.000.000			2011100		
1976	1	TS	45	SUBTROP 1	- B-24					
1976	2	TS	40	ANNA						
1976	3	HU	105	7,0,0,0,0				BELLE		
1976	4	HU	80			CANDICE		Dette		
1976	2501	TS	45	DOTTIE		CANDICE				
			90	DOTTE			EMMY			
1976		HU	100				CIVILVI I	FRANCES		
1976	7	HU	1000	CUIDTROP				FRANCES		
1976	8	TS	11000	SUBTROP 3			OLODIA:			
1976	9	HU	90				GLORIA			
1976	10	HU	65			HOLLY				
	-							-	********	
1977	1	HU	150							ANITA
1977	2	HU	65			BABE				
1977	3	HU	65			CLARA				
1977	4	HU	75			DOROTHY	100			
1977	5	HU	70			EVELYN			0.0	
1977	6	TS	50		FRIEDA				4.0	
	1		****					Carlina I		
1978	1	TS	40	SUBTROP 1						
1978	2	TS	45	AMELIA						
1978	3	TS	45	BESS		1000000				
1978	4	HU	80	DEGG		CORA	3000			
and the same of	-//	TS	50		DEBRA	00101				
1978	5		120		DEBION		I and I would		ELLA	
1978	6	HU	85				FLOSSIE	17.25	LLD	
1978	7	HU	0.12522-0-1				PLUSSIE		GRETA	
1978	8	HU	115		uone				OKETA	
1978	9	TS	55	tent i i	HOPE					
1978	10	TS	45	IRMA						
1978	11	TS	45	JULIET	1	44894185				
1978	12	HU	70			KENDRA				11 11222 11334
	-			CONTROL OF					(
1979	1	TS	50		ANA					
1979	2	HU	65			вов	2011			
1979	3	TS	45	CLAUDETTE			U			
1979	4	HU	150						July Harry	DAVID
1010	5	TS	35	ELENA						
	1	HU	115	7.020.033.40					FREDERIC	
1979	6	19.1055	85				GLORIA		OXI TIENT	
1979 1979	7	HU				HENRI		0.000		
1979 1979 1979	7	HU	75							
1979 1979 1979 1979	7	HU	75 65			SUBTROP 1				
1979 1979 1979 1979 1979	7 8 9	HU	65			SUBTROP 1				
1979 1979 1979 1979 1979	7 8 9	HU HU	65	<u> 2011/20</u> -2		SUBTROP 1				ALLEN
1979 1979 1979 1979 1979 — 1980	7 8 9 	HU HU —	65 165	20020			BONNIE			ALLEN
1979 1979 1979 1979 1979	7 8 9 1 2	HU HU	65 165 85	<u> </u>			BONNIE			ALLEN

year	no.		kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1980	5	HU	65			EARL				
1980	6	HU	100					FRANCES		
1980	7	HU	70			GEORGES		FIGHOLS		
1980	8	TS	60		HERMINE	GEORGES				
1000000	200	150 150 150	2000		HERMINE					
1980	9	HU	90				IVAN			
1980	10	HU	85			STUDIES CO.	JEANNE			
1980	11	HU	75			KARL			2011	
-	-	-	11000	SHAME		*********				0.5000
1981	1	TS	50		ARLENE					v and
1981	2	TS	60		BRET				A CONTRACT	
1981	3	TS	50		CINDY					
1981	4	HU	70			DENNIS		- Tab. 14		
1981	5	HU	80	12		EMILY				
1981	6	HU	100			75000		FLOYD		
1981	7	HU	90				GERT	12010		
		100000	115				OLIVI		HARVEY	
1981	8	HU	ACC 1111					IRENE	THUCKET	
1981	9	HU	105	10000				IKENE	1 12	
1981	10	TS	45	JOSE						
1981	11	HU	75			KATRINA				
1981	12	TS	60		SUBTROP 3					10.00
			-			S2 1 1 1	and the same of		-	1.000
1982	1	HU	75			ALBERTO				
1982	2	TS	60		SUBTROP 1					
1982	3	TS	63		BERYL					
1982	4	TS	55		CHRIS					
1982	5	HU	115	_					DEBBY	10000
	6	TS	60		ERNESTO		10000		100000000000000000000000000000000000000	
1982					ENNESTO					
	-	-		*********		77.77.700		ALICIA		
1983	1	HU	100			100000000		ALIGIA		
1983	2	HU	70			BARRY				
1983	3	HU	65		at the least of th	CHANTAL				
1983	4	TS	55		DEAN	N N				
****	***		200				-			********
1984	1	TS	50		SUBTROP 1					
1984	2	TS	45	ARTHUR						
1984	3	TS	35	BERTHA						
1984	4	TS	50		CESAR					
1984	5	HU	115		5,5000				DIANA	
	100	100	55		EDOUARD				100	
1984	6	TS	55		FRAN					
1984	7	TS	55353	CHICTAN	FIONI					
1984	8	TS	45	GUSTAV		HODTENES			-	
1984	9	HU	65		IMPORE	HORTENSE				
1984	10	TS	50		ISIDORE		IOSES! W.			
1984	11	HU	90				JOSEPHINE			-
1984	12	HU	80			KLAUS			A 100	
1984	13	HU	70			LILI				
	-			-	*********	********				-
1985		TS	60		ANA	1				The same
1985	-	HU	65			BOB				
-	-	HU	75			CLAUDETTE				
1985	-	and the latest				DANNY				
1985	-	HU				Sister.		ELENA		
1985	-	HU	-		EARIAN	-		1,000,000		
1985	6	TS	55		FABIAN				GLORIA	
1985	7	HU			0.00				GLONIA	
1985	8	TS	50		HENRI	1		1		

year	no.		kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1985	9	TS	60		ISABEL		3.,_	- Catagony C	category :	calegoly c
1985	10	HU	75			JUAN	100			
1985	11	HU	105				1	KATE	1	
		-	****							
1986	1	TS	45	ANDREW						
1986	2	HU	75			BONNIE			3.5	
1986	3	HU	70			CHARLEY				
1986	4	TS	50		DANIELLE				1 2 3 3 3	***
1986	5	HU	90				EARL			A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1986	6	HU	75			FRANCES		4.3		
	_	_								*******
1987	1	TS	40	NOT NAMED		\$1.79 kg/ks	,			
1987	2	HU	65			ARLENE	V 40 - 10			1
1987	3	TS	45	BRET				*		
1987	4	TS	45	CINDY						D.
1987	5	TS	45	DENNIS	ii.				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	V. 12.35 + 1
1987	6	HU	110		1,74.3			EMILY		
1987	7	HU	65			FLOYD		-		
			-							
1988	1	TS	35	ALBERTO						
1988	2	TS	45	BERYL						
1988	3	TS	45	CHRIS			1.4 7.			Y
1988	4	HU	65			DEBBY			4-1	
1988	5	TS	55		ERNESTO		4.2	Detail 1		
1988	6	TS	50		NOT NAMED					
1988	7	HU	70			FLORENCE				
1988	8	HU	160						1.1	GILBERT
1988	9	HU	125		* * * * * * * * * * * * * * * * * * * *				HELENE	
1988	10	TS	40	ISAAC					in and	
1988	11	HU	125						JOAN	- 1. 1. 1
1988	12	TS	60		KEITH		A SAME I			13334
_	-	_								
1989	1	TS	45	ALLISON		* 1 .				-
1989	2	TS	45	BARRY			11/11/1		100	No.
1989	3	HU	70			CHANTAL			21 11 20	April
1989	4	HU	90				DEAN			
1989	5	HU	90				ERIN		1011	50:
1989	6	HU	75			FELIX	10.18			
1989	7	HU	125			1 1 1 1 1 1 1			GABRIELLE	111100
1989	8	HU	140							HUGO
1989	9	TS	60		IRIS	15001				
1989	10	HU	75			JERRY			* * *	2-3-3
1989	11	TS	50		KAREN			<u> </u>		
	-	-	-							
1990	1	TS	60		ARTHUR	PEDTUA.				Y
1990	2	HU	70	05045		BERTHA				
1990	3	TS	45				DlavIA	-	*	A A
1990	4	HU	85				DIANA			*
1990	5	TS	40							
1990	6	TS	35					GUSTAV	 	
1990	7	HU	105		LIOPTENIO			GUSTAV	184 5	
1990	8	TS	55	1	HORTENSE	3.00	ICIDODE			W.
1990	9	HU	85			IOSEDI IIVE	ISIDORE		The series	1
1990	10	HU	75			JOSEPHINE			1 2 2	
1990	11	HU	70			KLAUS				2,47

year	no.	-	kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1990	12	HU	65			LILI				
1990	13	TS	55		MARCO					
1990	14	HU	75	1 1		NANA				121
	-	-	-	***********						
1991	1	TS	45	ANA	1				<u> </u>	
1991	2	HU	100					вов	1	
1991	3	ΗŲ	115						CLAUDETTE	
1991	4	TS	45	DANNY	0					
1991	5	TS	50		ERIKA					
2.55.51	3	TS	40	FABIAN						
+	Semi	HU	85				GRACE		·	
1991	8	HU	65			UNNAMED		· · · · · · · · · · · · · · · · · · ·	-	
		_								
1992	1	TS		SUBTROP						
1992	-	10	-	CODING		2.2		3.7	ANDREW	22,6
1332		1	-				BONNIE		71101121	
	-	HU	95				CHARLEY	7 (5.47)		
4000	-	SO ATATIONS	55		DANIELLE		OTANLLI	15.72.50		
1992	5	TS	55				+		 	
1992	6	TS		4	EARL	FRANCES	-		ļ	
1992	,	HU	75		1	PRANCES				
		-					+		-	
1993	1	TS	35	ARLENE					-	
1993	2	TS	50		BRET					
1993	3	TS	40	CINDY						
1993	4	TS	45	DENNIS						
1993	5	HU	100			and the same of		EMILY	2000	
1993	6	HU	65			FLOYD			71 Def 4	
1993	7	HU	85				GERT			
1993	8	HU	65			HARVEY				
					*********				-	
1994	1	TS	55							
1994	2	TS	50							
1994	3	HU	70		120	CHRIS				
1994	4	TS	60		DEBBY			TE THE		
1994	5	TS	50		ERNESTO					100
1994	6	HU	95				FLORENCE		The colonial	
1994	7	HU	75			GORDON				100
1334	C1531		-							- Lilenson
1005			65		+	Secretary Fifty			11740 1110	
1995	1	HU	60		BARRY					-
1995	2	TS	60		CHANTAL					
1995	3	TS		DEAN	CHANTAL					
1995	4	TS	40	DEAN		ERIN				
1995	5	HU	80			ENIN			FELIX	
1995	6	HU	120		CARDIELLE				Leady	
1995	7	TS	60		GABRIELLE		NUMBERTO			
1995	8	HU	95				HUMBERTO			
1995	9	HU	95				IRIS			
1995	10	TS	35	JERRY						
1995	11	TS	45	KAREN					1,110	
1995	12	HU	130						LUIS	271
1995	13	HU	100			1000	12	MARILYN		
1995	14	HU	65			NOEL				
1995	15	HU	130						OPAL	
-	16	TS	50		PABLO					
1995			100					ROXANNE		

year	no.	-	kts	category -1	category 0	category 1	category 2	category 3	category 4	category 5
1995	18	TS	55	7	SEBASTIEN	1		3.5		
1995	19	HU	75			TANYA				
	-	-	_							
1996	1	TS	40	ARTHUR				.4.		
1996	2	HU	100			. Ad		BERTHA		
1996	3	HU	70	14		CESAR			4.3	
1996	4	HU	70			DOLLY		47.4		
1996	5	HU	125			10 Au 12 Au	- 185 A	2.7	EDOUARD	
1996	6	HU	105	1				FRAN		
1996	7	TS	40	GUSTAV		(). ().	•	A. T.		
1996	8	HU	120						HORTENSE	1.1
1996	9	HU	100			₹ 3	1	ISIDORE		
1996	10	TS	60	***	JOSEPHINE	•		(196. M (200. M)		
1996	11	TS	45	KYLE					540	
1996	12	HU	100					LILI		
1996	13	HU	65			MARCO				