

## **CHAPTER 4**

**SUMMARY OF TROPICAL CYCLONES 1971**

TABLE 4-1. SUMMARY OF WESTERN PACIFIC  
TROPICAL CYCLONES OF 1971

	<u>1960-1970</u> <u>(AVG)</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
TOTAL NUMBER OF WARNINGS	730	430	533	747
CALENDAR DAYS OF WARNING	150	108	127	163
NUMBER OF WARNING DAYS WITH TWO OR MORE CYCLONES	54	15	29	54
NUMBER OF WARNING DAYS WITH THREE OR MORE CYCLONES	13	1	0	6
TROPICAL DEPRESSIONS	6	4	3	2
TROPICAL STORMS	10	6	12	11
TYPHOONS	19	13	12	24
TOTAL TROPICAL CYCLONES	35	23	27	37

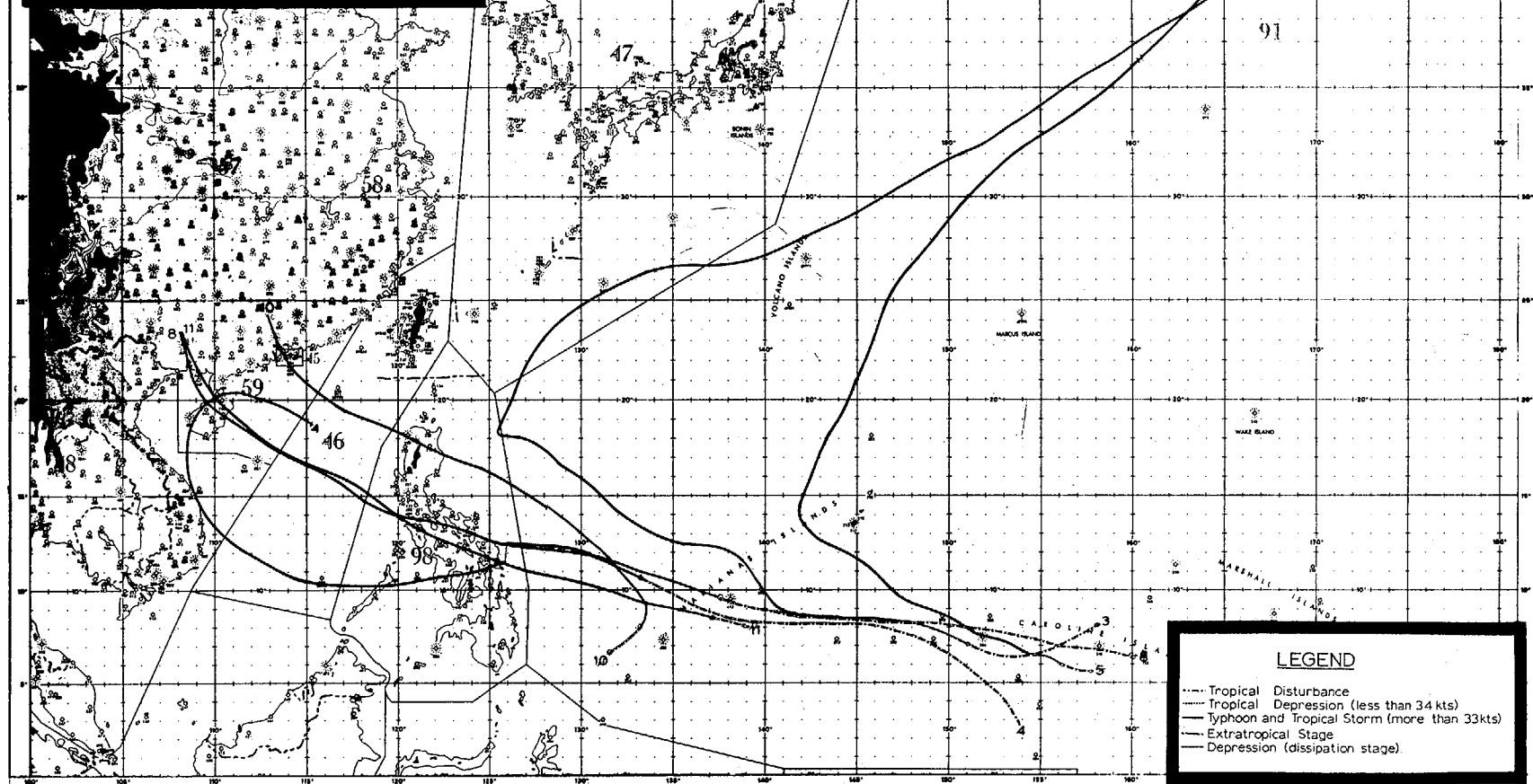
TABLE 4-2. SUPER TYPHOONS DURING 1971

CYCLONE NUMBER	NAME	INCLUSIVE DATES	MAX INTENSITY	MIN SLP	MIN 700 MB	HT
05	AMY	29 APR-07 MAY	150 KT	895 MB	2169	M
16	LUCY	16 JUL-22 JUL	130 KT	915 MB	2295	M
18	NADINE	20 JUL-26 JUL	150 KT	898 MB	2185	M
27	WENDY	04 SEP-13 SEP	140 KT	915 MB	2338	M
30	BESS	17 SEP-23 SEP	140 KT	911 MB	2268	M
37	IRMA	08 NOV-15 NOV	155 KT	884 MB	2040	M

**WESTERN NORTH PACIFIC TYPHOONS**

**1971 (JAN-JUN)**

STORM NO.	NAME	DATES
03	VERA	APR 08-18
04	WANDA	APR 23-MAY 04
05	AMY	APR 29-MAY 07
08	DINAH	MAY 25-30
10	FREDA	JUN 14-18
11	GILDA	JUN 24-28
† SUPER TYPHOON (130 KTS OR MORE)		

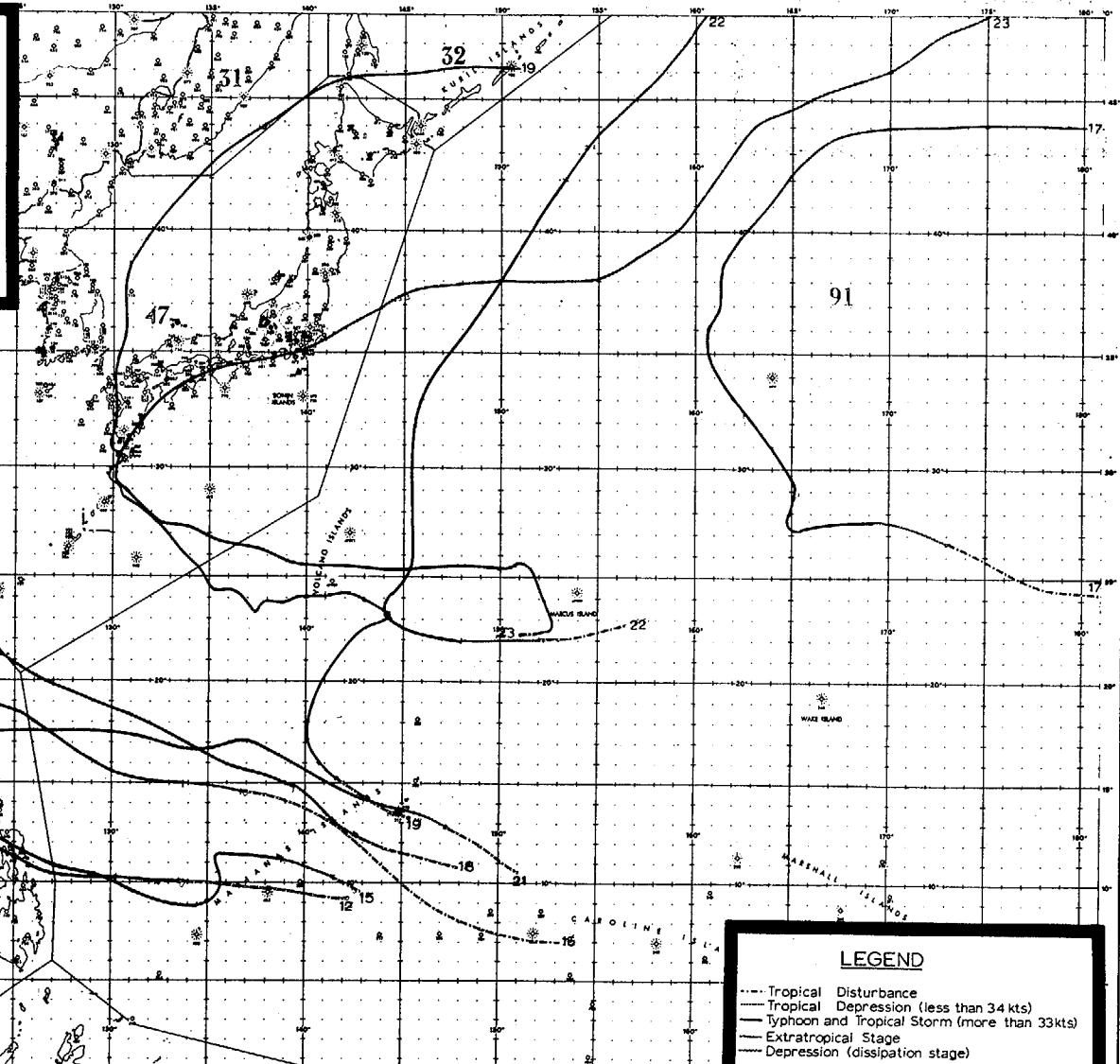
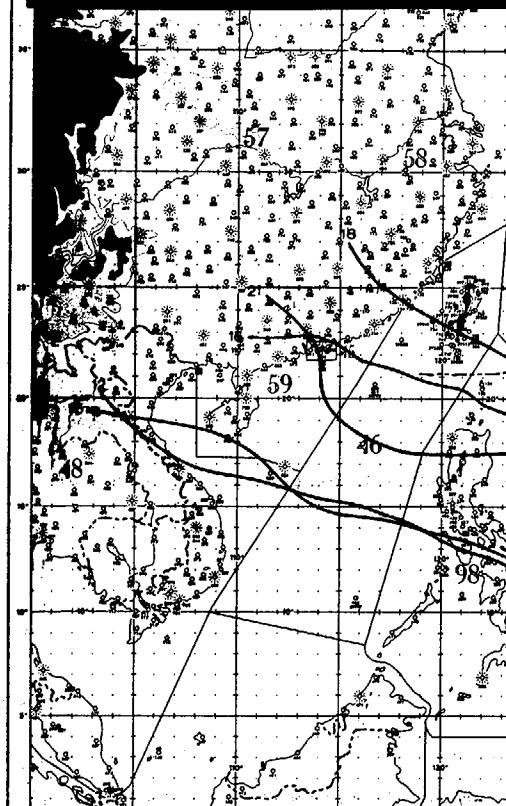


**WESTERN NORTH PACIFIC TYPHOONS**

**1971 (JUL-AUG)**

STORM NO.	NAME	DATES
12	HARRIET	JUL 02-07
15	JEAN	JUL 09-18
16	LUCY †	JUL 16-22
17	MARY	JUL 17-20
18	NADINE †	JUL 20-26
19	OLIVE	JUL 29-AUG 06
21	ROSE	AUG 10-17
22	SHIRLEY	AUG 12-17
23	TRIX	AUG 20-31

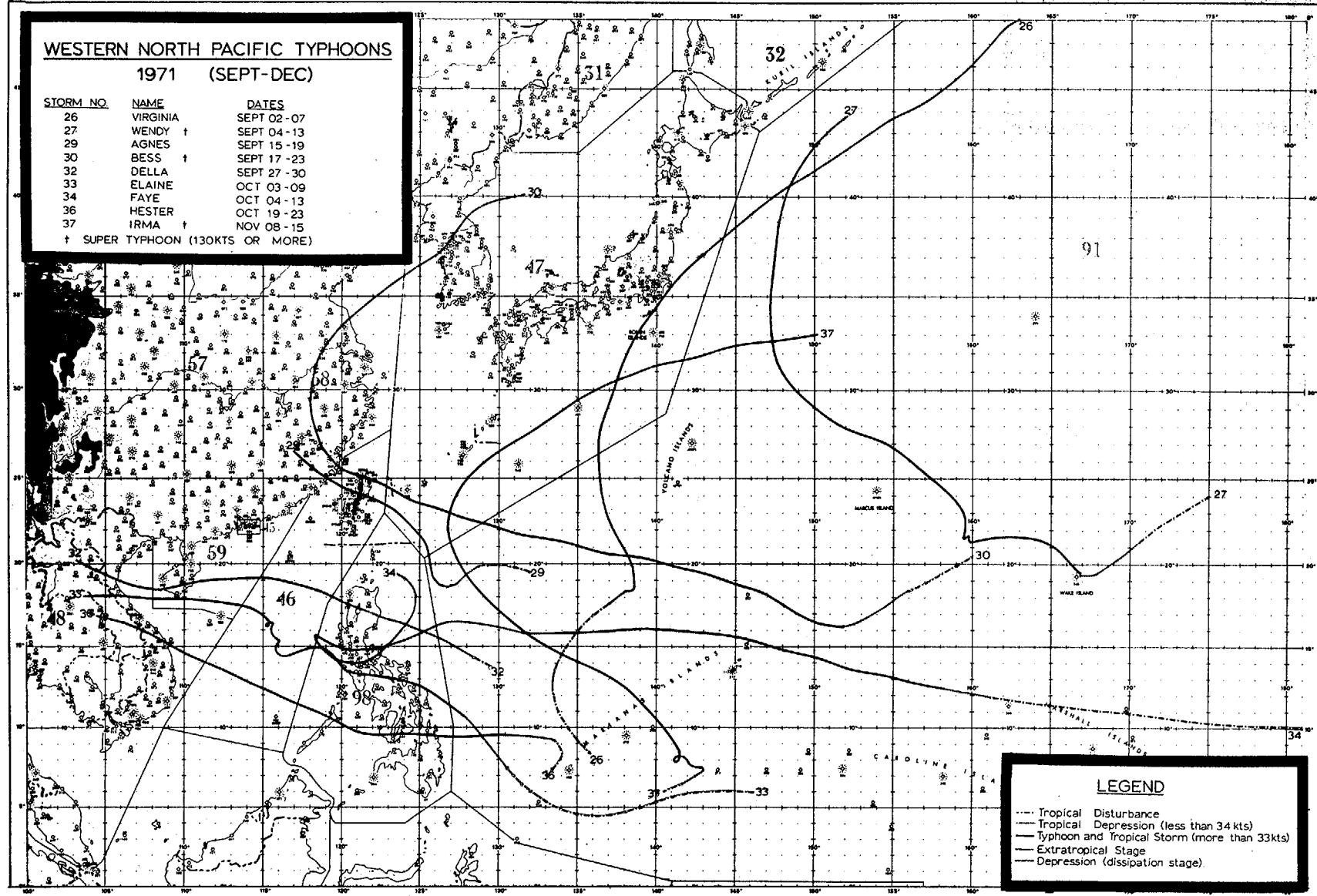
† SUPER TYPHOON (130 KTS OR MORE)



WESTERN NORTH PACIFIC TYPHOONS  
1971 (SEPT-DEC)

<u>STORM NO.</u>	<u>NAME</u>	<u>DATES</u>
26	VIRGINIA	SEPT 02 -07
27	WENDY	SEPT 04 -13
29	AGNES	SEPT 15 -19
30	BESS	SEPT 17 -23
32	DELLA	SEPT 27 -30
33	ELAINE	OCT 03 -09
34	FAYE	OCT 04 -13
36	HESTER	OCT 19 -23
37	IRMA	NOV 08 -15
†	SUPER TYPHOON (130KTS OR MORE)	

† SUPER TYPHOON (130KTS OR MORE)



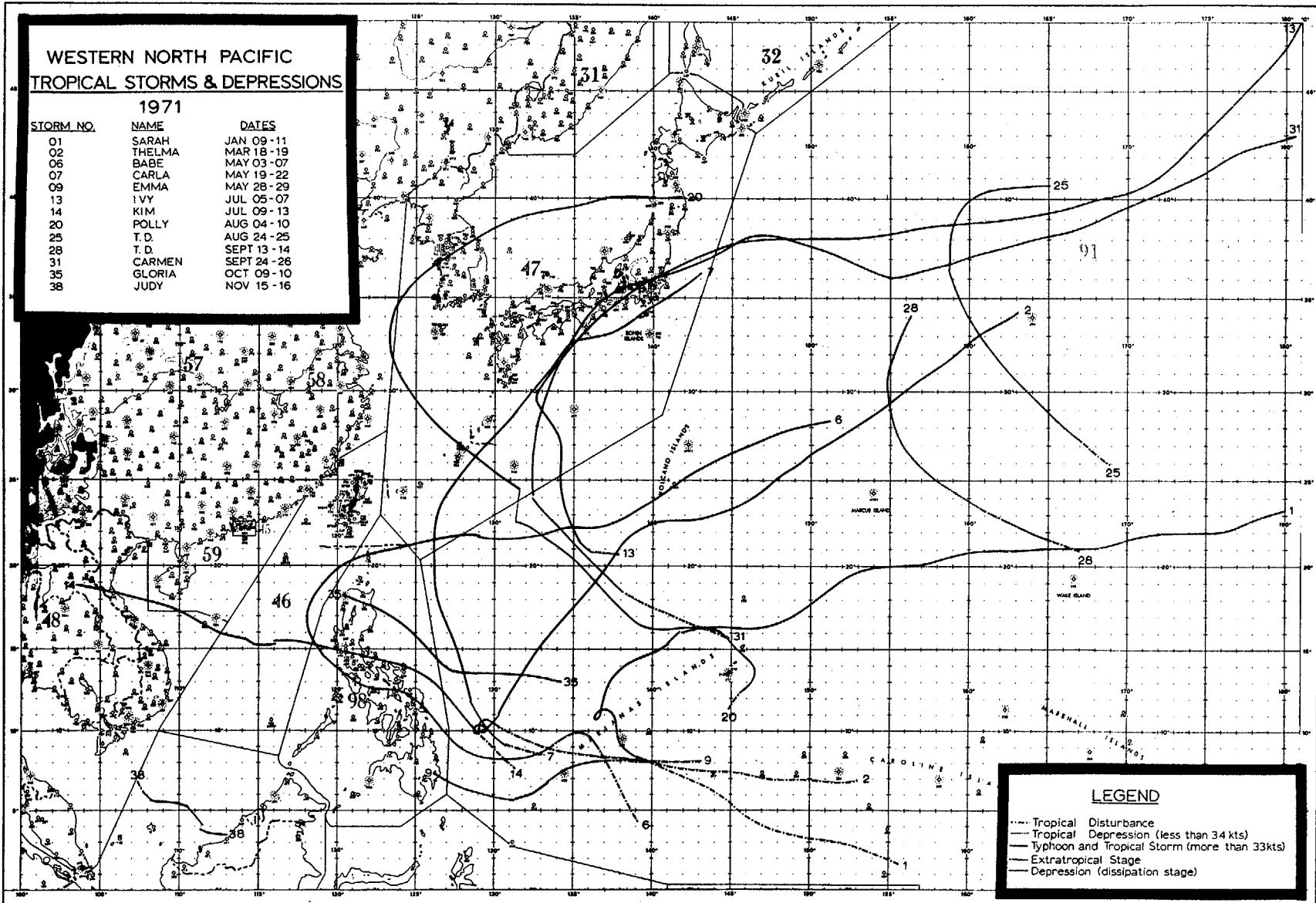


TABLE 4-3. 1971 TROPICAL CYCLONES

CYCLONE	TYPE	NAME	DATE	CALENDAR DAYS OF WARNING	MAX SFC	MIN OBS SLP	WARNINGS ISSUED		
							TOTAL	NO. AS TYPHOONS	DISTANCE TRAVELED*
01	TS	SARAH	09 JAN-11 JAN	3	50	989	10	0	558
02	TS	THELMA	18 MAR-19 MAR	2	45	992	6	0	320
03	T	VERA	08 APR-18 APR	10	90	960	33	15	1770
04	T	WANDA	23 APR-04 MAY	12	75	980	41	7	1653
05	T	AMY	29 APR-07 MAY	9	150	895	35	25	2568
06	TS	BABE	03 MAY-07 MAY	5	55	987	18	0	1278
07	TS	CARLA	19 MAY-22 MAY	4	50	989	15	0	996
08	T	DINAH	25 MAY-30 MAY	6	90	956	21	13	1386
09	TS	EMMA	28 MAY-29 MAY	2	35	1000	5	0	354
10	T	FREDA	14 JUN-18 JUN	5	65	978	15	8	858
11	T	GILDA	24 JUN-28 JUN	5	90	975	16	11	1308
12	T	HARRIET	02 JUL-07 JUL	6	125	921	20	11	1398
13	TS	IVY	05 JUL-07 JUL	3	60	978	11	0	1032
14	TS	KIM	09 JUL-13 JUL	5	50	984	18	0	1260
15	T	JEAN	09 JUL-18 JUL	10	85	968	32	17	2310
16	T	LUCY	16 JUL-22 JUL	7	130	915	26	13	1290
17	T	MARY	17 JUL-20 JUL	4	80	973	15	3	762
18	T	NADINE	20 JUL-26 JUL	7	150	898	27	20	1590
19	T	OLIVE	29 JUL-06 AUG	9	85	935	32	16	1554
20	TS	POLLY	04 AUG-10 AUG	7	40	985	21	0	1869
21	T	ROSE	10 AUG-17 AUG	8	120	950	29	23	1920
22	T	SHIRLEY	12 AUG-17 AUG	6	90	955	20	17	1392
23	T	TRIX	20 AUG-31 AUG	12	100	915	45	34	1866
24	TD	(TD 24 PICKED UP BY CENTRAL PACIFIC HURRICANE CENTER, HONOLULU)							
25	TD	25	24 AUG-25 AUG	2	30	996	6	0	300
26	T	VIRGINIA	02 SEP-07 SEP	6	100	955	23	7	978
27	T	WENDY	04 SEP-13 SEP	10	140	915	34	29	1986
28	TD	28	13 SEP-14 SEP	2	25	998	2	0	60
29	T	AGNES	15 SEP-19 SEP	5	75	975	17	4	606
30	T	BESS	17 SEP-23 SEP	7	140	911	26	21	1908
31	TS	CARMEN	24 SEP-26 SEP	3	50	1000	10	0	1284
32	T	DELLA	27 SEP-30 SEP	4	70	981	15	5	1068
33	T	ELAINE	03 OCT-09 OCT	7	100	963	26	15	1332
34	T	FAYE	04 OCT-13 OCT	8	65	984	25	3	2710
35	TS	GLORIA	09 OCT-10 OCT	2	45	987	7	0	444
36	T	HESTER	19 OCT-23 OCT	5	90	967	18	10	1488
37	T	IRMA	08 NOV-15 NOV	8	155	884	31	25	2280
38	TS	JUDY	15 NOV-16 NOV	2	45	1004	3	0	66

1971 TOTALS

163\*\*

533

251

\*Data Taken From Best Track

\*\*Overlapping Days Included Only Once in Sum

## GENERAL SUMMARY, WESTERN PACIFIC TYPHOON SEASON OF 1971

The western Pacific produced a total of 35 named tropical cyclones in 1971 which is 10 more than the climatological average and ranks with 1967 as the second highest total on record since 1945 (Table 4-4). Of this total, 24 reached typhoon intensity which ties with 1962 for the second largest number on record (Table 4-5). Only 1964, with a fairly similar monthly distribution, ranks higher with 26 typhoons. It is interesting to note that the number of typhoons in 1971 was only one short of the combined total of 1969 and 1970 typhoons.

One uncommon feature this year was the unusual activity during April and May in which 7 tropical cyclones occurred. Climatology indicates only two storms for the two-month period. On 3 and 4 May, three tropical storms, Wanda, Amy and Babe were in existence simultaneously.

Another month marked by heavy activity was July which produced 8 tropical storms, 5 of which developed to typhoon intensity, surpassing the previous high of 7 attained in 1967. To place the July figure in proper perspective, on the average only 8 named tropical cyclones are observed in the Atlantic during an entire year.

In contrast to 1970, the subtropical ridge was well developed and persistent throughout most of the typhoon season. This provided a synoptic pattern of trade-wind produced cyclonic wind shear and a mechanism for mass transport towards developing depression centers. Both are considered important environmental conditions for tropical cyclone development (Simpson, 1971).

Monthly mean values of 700-mb height anomalies for the west Pacific indicated positive values along the climatological position of the subtropical ridge. During June and July, positive anomalies of over 30 m were centered near the Ryukyu chain (Posey, 1971 and Wagner, 1971). This created an unusual synoptic regime for that time of year which steered storms on a westerly course into the South China Sea and also contributed to a drought condition on Okinawa. A succession of 6 tropical storms crossed the Philippine Islands into the South China Sea during mid-June to mid-July which is unparalleled for the early summer in the west Pacific.

The semi-permanent upper tropospheric mid-Pacific trough acted as an initiator of at least 25% of the 1971 typhoons. Circulations that later developed into typhoons

TABLE 4-4. FREQUENCY OF TROPICAL STORMS (INCLUDING TYPHOONS) BY MONTHS AND YEARS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1945	0	0	0	1	1	2	5	7	6	1	3	0	26
1946	0	0	1	0	1	1	3	2	3	1	2	0	15
1947	0	0	1	0	1	1	3	3	5	6	6	1	27
1948	1	0	0	0	2	2	2	5	5	4	3	2	26
1949	1	0	0	0	0	1	5	3	6	1	3	2	22
1950	0	0	0	0	1	2	3	2	3	3	3	1	18
1951	0	0	1	2	1	1	1	2	2	4	1	2	17
1952	0	0	0	0	0	3	3	4	5	6	3	4	28
1953	0	1	0	0	1	2	2	6	3	4	3	1	23
1954	0	0	1	0	1	0	1	6	4	3	3	0	19
1955	1	0	1	1	0	1	6	3	3	4	1	1	22
1956	0	0	1	2	0	1	2	5	5	2	3	1	22
1957	2	0	0	1	1	1	1	3	5	4	3	0	21
1958	1	0	0	0	1	3	5	3	3	2	1	22	
1959	0	1	1	1	0	0	3	6	6	4	2	2	26
1960	0	0	0	1	1	3	3	10	3	4	1	1	27
1961	1	1	1	1	3	2	5	4	6	5	1	1	31
1962	0	1	0	1	2	0	6	7	3	5	3	2	30
1963	0	0	0	1	1	3	4	3	5	5	0	3	25
1964	0	0	0	0	2	2	7	9	7	6	6	1	40
1965	2	2	1	1	2	3	5	6	7	2	2	1	34
1966	0	0	0	1	2	1	5	8	7	3	2	1	30
1967	1	0	2	1	1	1	6	8	7	4	3	1	35
1968	0	0	0	1	1	1	3	8	3	6	4	0	27
1969	1	0	1	1	0	0	3	4	3	3	2	1	19
1970	0	1	0	0	0	2	2	6	4	5	4	0	24
1971	1	0	1	3	4	2	8	4	6	4	2	0	35
Totals	12	7	13	20	30	42	104	137	125	102	71	30	691
Avg.	.44	.25	.48	.74	1.11	1.56	3.85	5.07	4.63	3.78	2.63	1.11	25.59

TABLE 4-5. FREQUENCY OF TROPICAL STORMS REACHING TYPHOON INTENSITY BY MONTHS AND YEARS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1945	0	0	0	0	0	1	2	5	3	1	1	0	13
1946	0	0	1	0	1	1	3	1	3	1	2	0	13
1947	0	0	0	0	1	1	0	3	4	5	4	1	19
1948	1	0	0	0	2	0	2	2	4	1	2	1	15
1949	1	0	0	0	0	1	3	3	3	1	1	1	14
1950	0	0	0	0	1	1	1	2	1	3	2	1	12
1951	0	0	1	2	1	1	1	2	2	3	1	2	16
1952	0	0	0	0	0	3	1	3	3	4	3	2	19
1953	0	1	0	0	1	1	2	4	2	4	1	1	17
1954	0	0	0	0	1	0	1	4	4	2	3	0	15
1955	1	0	1	1	0	1	5	3	3	2	1	1	19
1956	0	0	1	1	0	0	2	4	5	1	3	1	18
1957	1	0	0	1	1	1	1	2	5	3	3	0	18
1958	1	0	0	0	1	3	4	3	3	3	1	1	20
1959	0	0	0	1	0	0	1	5	3	3	2	2	17
1960	0	0	0	1	0	2	2	8	0	4	1	1	19
1961	0	0	1	0	2	1	3	3	5	3	1	1	20
1962	0	0	0	1	2	0	5	7	2	4	3	0	24
1963	0	0	0	1	1	2	3	3	3	4	0	2	19
1964	0	0	0	0	2	2	6	3	5	3	4	1	26
1965	1	0	0	1	2	2	4	3	5	2	1	0	21
1966	0	0	0	1	2	1	3	6	4	2	0	1	20
1967	0	0	1	1	0	1	3	4	4	3	3	0	20
1968	0	0	0	1	1	1	1	4	3	5	4	0	20
1969	1	0	0	1	0	0	2	3	2	3	1	0	13
1970	0	1	0	0	0	1	0	4	2	3	1	0	12
1971	0	0	0	3	1	2	6	3	5	3	1	0	24
Totals	7	2	6	17	23	30	67	97	88	76	50	20	483
Avg.	.26	.07	.22	.63	.85	1.11	2.48	3.59	3.26	2.81	1.85	.74	17.89

Dinah, Mary, Shirley, Wendy, Trix and Bess originated from downward extensions of upper tropospheric cyclonic cells east of 150E during the months of May, July, August and September.

Six typhoons crossed the 130-kt threshold into the category of super typhoons. This closely matches the annual average (1959-70) of 5.8. The most intense storm of the year was typhoon Irma with winds in excess of 150 kt. A dropsonde measurement of 884 mb in the eye of Irma was the lowest central pressure measured in over a decade.\* Super typhoons Lucy, Nadine and Wendy were the largest with their circulations dominating an area 600 n mi or more in radius and gale force winds extending outward for 300 n mi or more.

The most disasterous typhoon in 1971 was Rose which struck Hong Kong in August. Approximately 130 people were killed, 5,000 persons were left homeless and 28 ocean-going vessels were run aground or sunk. Hester, which struck the Vietnam coast near Chu Lai in October, was probably the most destructive storm in terms of U.S. military damage during the entire war.

As damage and casualty statistics are incomplete for the 1971 season, mention is made on an individual basis for each storm narrative. Figures were based on data from the following sources: Weather Bureau of the Republic of China; Royal Observatory of Hong Kong; Office of the High Commissioner, Trust Territory of the Pacific Islands; Casualty Returns, Liverpool Underwriters Association; Director of Meteorology, Republic of Vietnam; Japan Meteorological Agency; Weather Bureau of the Republic of the Philippines; and the Environmental Data Service, NOAA.

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\*A record-low pressure of 877 mb was measured in the eye of typhoon Ida - Sep 1958 (Jordan, 1959).

TABLE 4-6. TYPHOON DAYS 1959-1971

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL PER YEAR
1959	---	---	---	8	---	---	3	18	19	18*	10	18	94
1960	---	---	---	2	---	10	13	36*	---	23*	2*	12	98
1961	---	---	8	---	8	2	10*	15	23*	17*	6	6	95
1962	---	---	---	7	4	---	14*	37*	8	30*	19*	---	119
1963	---	---	---	4	5	15	11	23*	14*	24*	---	11	107
1964	---	---	---	---	7	5*	22*	18*	28*	14	11*	6	111
1965	2	---	---	2	5	12*	19*	23*	25*	14	6	---	108
1966	---	---	---	5	11	6	7*	16*	23*	11	4	3	86
1967	---	---	2	7	---	4	14*	10	32*	21*	21*	---	111
1968	---	---	---	6	1	7	6	8	32*	19	18*	---	97
1969	5	---	---	5	---	---	8	6	10	18	10*	---	62
1970	---	5	---	---	---	2	5	24*	16	21*	6	---	79
1971	---	---	---	4	13*	8	20*	27*	21*	11*	7	---	111
TOTAL	7	5	10	50	54	71	152	261	251	241	120	56	1278
MEAN	.54	.38	.77	3.8	4.2	5.5	11.7	20.1	19.3	18.5	9.2	4.3	98.3

\*Two typhoons occurring on the same day are counted as two typhoon days.

TABLE 4-7. LIST OF ESTIMATED CASUALTIES AND AFFECTED GEOGRAPHICAL LOCATIONS FOR THE 1971 TYPHOON SEASON

NAME	DEATHS	MISSING	PRINCIPAL AREAS AFFECTED
SARAH	-	-	Remained over water
THELMA	-	-	Remained over water
VERA	-	-	Remained over water
WANDA	79	39	Philippines, Vietnam, Hainan Island
AMY	1	-	Truk District, Marianas
BABE	-	-	Philippines
CARLA	-	-	Ryukyus
DINAH	13	44	Philippines, Hainan Island, South China
EMMA	-	-	Remained over water
FREDA	7	-	Philippines, Hong Kong, South China
GILDA	1	-	Philippines, Hainan Island, South China
HARRIET	5	14	Philippines, Vietnam
IVY	1	-	Japan
KIM	-	-	Philippines, Vietnam
JEAN	-	-	Philippines, Hainan Island, Vietnam
LUCY	2	5	Philippines, Taiwan, Hong Kong, China
MARY	-	-	Remained over water
NADINE	32	25	Philippines, Taiwan, China, Japan
OLIVE	69	-	Japan
POLLY	-	-	Ryukyus
ROSE	130	-	Philippines, Hong Kong, China
SHIRLEY	-	-	Remained over water
TRIX	45	-	Bonin Island, Japan
VIRGINIA	56	-	Japan
WENDY	-	-	Wake Island
AGNES	1	5	Taiwan, China
BESS	32	6	Northern Marianas, Taiwan, China
CARMEN	20	-	Japan
DELLA	-	-	Philippines, Hainan Island, Vietnam
ELAINE	37	-	Philippines, Hainan Island, Vietnam
FAYE	3	-	Marianas, Philippines
GLORIA	10	80	Philippines
HESTER	91	2	Philippines, Vietnam
IRMA	-	-	Ryukyus
JUDY	-	-	Remained over water
TOTALS	635	220	

1971 TROPICAL STORM AND DEPRESSION  
POSITION DATA

TROPICAL STORM SARAH

0500Z 9 JAN TO 1100Z 11 JAN

BEST TRACK			WARNING			24 HUUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	ERRORS	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND
090500Z 10.7N 137.8E	35 10.7N 137.9E	25 6 -10	13.7N 137.8E	45 125 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
091100Z 11.1N 137.2E	45 11.4N 137.6E	30 29 -10	14.4N 137.3E	55 79 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
091700Z 11.1N 136.7E	45 11.5N 136.9E	35 27 -10	13.6N 135.6E	55 208 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
092300Z 10.8N 136.8E	50 10.5N 136.5E	40 25 -10	11.3N 135.6E	55 344 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
100500Z 11.8N 136.9E	50 11.7N 137.0E	50 8 0	15.5N 139.2E	60 100 25	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
101100Z 13.1N 137.5E	45 13.4N 137.4E	50 6 5	17.4N 140.7E	55 117 25	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
101700Z 14.4N 139.3E	40 14.3N 138.8E	50 18 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
102300Z 14.8N 140.3E	40 15.0N 140.8E	50 31 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
110500Z 15.2N 140.9E	35 15.2N 141.2E	35 17 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
111100Z 15.7N 141.7E	30 15.8N 141.5E	35 13 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

TROPICAL STORM THFIMA

0500Z 18 MAR TO 1100Z 19 MAR

BEST TRACK			WARNING			24 HUUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	ERRORS	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND
180500Z 10.2N 129.5E	45 9.9N 129.2E	45 25 0	10.6N 128.5E	60 137 35	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
181100Z 9.9N 128.8E	30 10.3N 128.6E	40 27 10	11.7N 127.3E	40 264 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
181700Z 9.2N 129.7E	25 10.2N 129.0E	40 73 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
182300Z 9.2N 129.8E	25 10.5N 129.9E	40 79 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
190500Z 11.6N 130.6E	25 12.5N 130.7E	40 54 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
191100Z 13.1N 131.6E	29 13.2N 132.2E	20 35 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

TROPICAL STORM BABE

0000Z 3 MAY TO 0600Z 7 MAY

BEST TRACK			WARNING			24 HUUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	ERRORS	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND
030000Z 14.8N 119.0E	45 14.8N 119.0E	30 0 -15	15.9N 115.5E	45 171 -10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
030600Z 15.5N 118.5E	45 15.5N 118.5E	50 0 5	17.7N 116.3E	60 109 10	20.2N 114.6E	60 314 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
031200Z 16.0N 118.2E	50 16.1N 118.1E	50 8 0	18.5N 116.7E	60 98 15	21.1N 115.6E	55 342 5	23.9N 115.0E	25 401 -10	-- --	-- --	-- --	-- --	-- --	-- --
031800Z 16.4N 118.1E	50 16.2N 118.0E	50 13 0	17.8N 116.7E	60 126 15	19.6N 115.8E	60 422 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
040000Z 16.9N 118.1E	55 17.0N 118.0E	50 8 -5	18.9N 117.8E	60 87 15	21.7N 118.9E	60 335 15	24.4N 123.5E	40 550 15	-- --	-- --	-- --	-- --	-- --	-- --
040600Z 17.5N 118.2E	50 17.5N 118.2E	50 0 0	20.4N 119.6E	50 34 0	23.4N 123.9E	45 193 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
041200Z 18.2N 118.4E	45 18.2N 118.4E	45 0 0	20.9N 120.2E	40 86 -10	23.6N 124.9E	35 273 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
041800Z 18.7N 118.7E	45 18.9N 118.7E	40 12 -5	21.6N 121.0E	35 129 -15	24.1N 126.3E	35 332 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
050000Z 19.2N 119.3E	45 19.1N 119.1E	40 13 -5	21.3N 121.5E	35 189 -10	23.6N 126.6E	30 374 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
050600Z 20.3N 120.2E	50 20.3N 120.3E	50 6 0	22.6N 124.1E	40 161 0	24.6N 130.0E	30 304 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
051200Z 20.6N 121.7E	50 21.1N 121.6E	45 25 -5	23.6N 127.2E	35 171 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
051800Z 20.9N 123.2E	50 21.4N 122.9E	45 34 -5	23.5N 128.7E	35 203 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
060000Z 21.2N 124.9E	45 21.5N 124.2E	45 43 0	23.8N 130.3E	35 195 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
060600Z 21.6N 126.6E	50 21.7N 126.6E	50 13 10	26.0N 134.2E	35 230 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
061200Z 21.5N 129.3E	35 22.3N 129.2E	45 48 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
061800Z 21.3N 131.5E	30 21.3N 132.0E	40 28 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
070000Z 21.8N 133.1E	25 20.9N 134.6E	35 99 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
070600Z 22.2N 134.9E	28 22.8N 135.8E	25 61 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

TROPICAL STORM CARLA

0600Z 19 MAY TO 1800Z 22 MAY

BEST TRACK			WARNING			24 HUUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	ERRORS	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND
190600Z 14.0N 127.9E	45 14.5N 127.7E	40 32 -5	19.0N 128.1E	50 120 5	24.1N 131.6E	35 364 -10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
191200Z 14.8N 127.7E	45 15.3N 127.6E	45 30 0	19.7N 128.4E	50 141 5	24.7N 132.1E	30 381 -10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
191800Z 15.7N 127.4E	50 16.3N 127.6E	50 38 0	20.8N 129.1E	50 195 5	25.6N 133.2E	30 424 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
200000Z 16.7N 127.0E	50 16.8N 127.0E	50 6 0	20.8N 127.7E	50 103 5	25.3N 132.5E	30 328 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
200600Z 17.5N 126.7E	45 17.5N 126.6E	50 6 5	20.9N 126.5E	50 25 5	24.7N 130.9E	30 171 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
201200Z 18.3N 126.4E	45 18.4N 126.3E	45 8 0	22.3N 127.8E	35 106 -5	26.0N 133.0E	30 213 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
201800Z 19.0N 126.2E	45 18.9N 126.2E	40 6 -5	22.5N 128.0E	30 99 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
210000Z 19.8N 126.2E	45 19.0N 126.0E	45 16 0	22.8N 128.5E	35 115 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
210600Z 20.6N 126.2E	45 20.6N 126.5E	45 17 0	23.3N 131.2E	35 217 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
211200Z 21.5N 126.1E	40 21.4N 126.1E	35 6 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
211800Z 22.5N 126.2E	35 22.4N 126.1E	35 19 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
220000Z 23.8N 126.7E	35 23.8N 126.7E	35 0 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
220600Z 25.2N 127.8E	30 25.4N 127.6E	35 16 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
221200Z 26.7N 129.1E	25 26.0N 129.0E	30 8 5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
221800Z 28.6N 131.2E	20 28.4N 131.1E	30 13 10	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

## TROPICAL STORM EMMA

1200Z 28 MAY TO 1200Z 29 MAY

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	ERRORS
281200Z 6.1N 132.4E	35 6.0N 132.6E	40 13 5 5.7N 128.7E	50 142 25	---	---	---	---	---	---	---	---	---	---	---
281800Z 5.8N 130.9E	30 6.0N 131.5F	40 40 10	---	---	---	---	---	---	---	---	---	---	---	---
290000Z 5.9N 129.5E	25 5.2N 130.0F	35 51 10	---	---	---	---	---	---	---	---	---	---	---	---
290600Z 6.3N 128.0E	25 5.9N 128.2E	25 27 0	---	---	---	---	---	---	---	---	---	---	---	---
291200Z 7.0N 126.7E	25 6.0N 128.0E	20 98 -5	---	---	---	---	---	---	---	---	---	---	---	---

## TROPICAL STORM IVY

0600Z 5 JUL TO 1800Z 7 JUL

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	ERRORS
050600Z 22.6N 134.4E	50 22.4N 134.8E	50 12 0	24.5N 133.5E	55 289 -5	26.6N 132.1E	60 469 10	---	---	---	---	---	---	---	---
051200Z 23.7N 134.5E	55 23.5N 134.7E	40 16 -15	27.1N 134.1E	60 177 -10	29.9N 133.6E	55 380 15	---	---	---	---	---	---	---	---
051800Z 26.1N 134.2E	55 24.8N 134.4E	45 78 -10	26.5N 133.9E	55 141 0	31.3N 133.9E	55 432 25	---	---	---	---	---	---	---	---
060000Z 28.3N 133.6E	60 28.3N 134.0E	55 21 -5	32.5N 134.7E	60 13 5	---	---	---	---	---	---	---	---	---	---
060600Z 29.3N 132.8E	60 29.3N 132.8E	60 0 0	33.5N 131.1E	55 224 5	---	---	---	---	---	---	---	---	---	---
061200Z 29.8N 132.7E	60 30.1N 132.6E	60 19	34.8N 132.2E	45 289 5	---	---	---	---	---	---	---	---	---	---
061800Z 30.8N 133.3E	55 30.7N 133.0E	60 17 5	34.7N 134.5E	50 299 20	---	---	---	---	---	---	---	---	---	---
070000Z 32.3N 134.8E	55 32.9N 134.4E	50 41 -5	---	---	---	---	---	---	---	---	---	---	---	---
070600Z 33.6N 136.2E	50 34.2N 135.3E	55 57 5	---	---	---	---	---	---	---	---	---	---	---	---
071200Z 35.0N 138.1E	40 35.1N 138.2F	45 8 5	---	---	---	---	---	---	---	---	---	---	---	---
071800Z 36.1N 140.4E	30 36.2N 140.2E	35 11 5	---	---	---	---	---	---	---	---	---	---	---	---

## TROPICAL STORM KIM

0600Z 9 JUN TO 1200Z 13 JUL

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	ERRORS
000600Z 13.3N 125.4E	20 13.3N 125.5E	30 6 10	14.7N 119.6E	45 99 20	---	---	---	---	---	---	---	---	---	---
01200Z 14.3N 123.6E	20 13.8N 124.5E	30 60 10	14.7N 118.5E	40 117 10	---	---	---	---	---	---	---	---	---	---
01800Z 14.6N 121.7E	20 14.0N 123.7E	30 121 10	14.7N 117.6E	45 115 10	---	---	---	---	---	---	---	---	---	---
00000Z 14.8N 119.7E	20 15.0N 119.5E	30 17 10	15.1N 112.7E	60 127 20	---	---	---	---	---	---	---	---	---	---
000600Z 15.3N 118.0E	25 14.9N 118.0E	30 24 5	15.2N 111.5E	60 157 10	---	---	---	---	---	---	---	---	---	---
01200Z 15.4N 116.6E	30 15.8N 115.8E	30 52 0	17.2N 108.5E	40 282 -10	---	---	---	---	---	---	---	---	---	---
01800Z 15.3N 115.7E	35 15.7N 115.4E	30 29 -5	16.7N 108.8E	40 198 -5	---	---	---	---	---	---	---	---	---	---
10000Z 15.2N 114.9E	40 15.3N 114.7E	40 13 0	15.6N 110.2E	50 87 5	17.0N 106.3E	35 72 -5	---	---	---	---	---	---	---	---
10600Z 15.5N 114.2E	50 15.3N 114.0E	50 17 0	15.6N 110.3E	60 78 15	16.6N 107.2E	50 129 15	---	---	---	---	---	---	---	---
11200Z 15.8N 113.2E	50 15.8N 113.2E	50 0 0	16.3N 109.7E	60 77 15	17.2N 106.4E	45 120 20	---	---	---	---	---	---	---	---
11800Z 16.1N 112.2E	45 15.9N 112.1E	50 13 5	16.6N 108.6E	60 82 15	---	---	---	---	---	---	---	---	---	---
20000Z 16.5N 111.4E	45 16.1N 111.2E	50 27 5	16.8N 107.7E	60 93 20	---	---	---	---	---	---	---	---	---	---
20600Z 16.9N 110.5E	45 16.7N 110.4E	55 13 10	17.8N 107.4E	60 74 25	---	---	---	---	---	---	---	---	---	---
21200Z 17.5N 109.2E	45 17.5N 109.2E	60 0 15	19.2N 105.7E	60 66 35	---	---	---	---	---	---	---	---	---	---
21800Z 17.8N 107.9E	45 17.9N 108.2E	60 18 15	---	---	---	---	---	---	---	---	---	---	---	---
30000Z 18.1N 106.8E	40 18.4N 107.3E	60 34 20	---	---	---	---	---	---	---	---	---	---	---	---
30600Z 18.3N 105.8E	35 18.2N 106.9E	60 63 25	---	---	---	---	---	---	---	---	---	---	---	---
31200Z 18.5N 104.8E	25 18.9N 105.4F	50 42 25	---	---	---	---	---	---	---	---	---	---	---	---

## TROPICAL STORM POLLY

0000Z 4 AUG TO 0000Z 10 AUG

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	ERRORS
40000Z 12.6N 145.9E	25 12.7N 146.0E	25 8 0	14.0N 145.2E	35 98 5	---	---	---	---	---	---	---	---	---	---
40600Z 13.4N 146.5E	30 12.8N 146.2E	30 40 0	13.5N 145.7E	35 195 5	---	---	---	---	---	---	---	---	---	---
41200Z 14.2N 146.1E	30 14.3N 146.4E	30 18 0	16.7N 144.3E	50 118 20	---	---	---	---	---	---	---	---	---	---
41800Z 14.4N 145.5E	30 14.6N 145.5E	30 18 0	16.5N 142.9E	50 119 20	---	---	---	---	---	---	---	---	---	---
50000Z 15.4N 144.8E	30 15.5N 144.6E	30 13 0	17.7N 142.0E	50 165 20	---	---	---	---	---	---	---	---	---	---
50600Z 16.2N 143.8E	30 16.4N 143.9E	30 13 0	18.7N 140.5E	50 158 25	---	---	---	---	---	---	---	---	---	---
51200Z 16.2N 142.3E	30 16.2N 142.3E	30 0 0	18.7N 140.5E	50 158 25	---	---	---	---	---	---	---	---	---	---
51800Z 16.1N 141.0E	30 16.4N 140.9E	30 19 0	18.7N 140.5E	50 158 25	---	---	---	---	---	---	---	---	---	---
60000Z 16.3N 139.5E	30 17.5N 140.0E	30 77 0	---	---	---	---	---	---	---	---	---	---	---	---
60600Z 17.2N 138.2E	25 16.9N 139.0E	25 62 0	---	---	---	---	---	---	---	---	---	---	---	---
71200Z 20.9N 134.3E	25 20.6N 134.5E	30 21 5	21.9N 131.7E	55 240 15	---	---	---	---	---	---	---	---	---	---
71800Z 21.6N 133.3E	25 20.6N 134.0E	35 62 10	22.3N 131.0E	65 293 25	24.1N 128.1E	80 481 40	---	---	---	---	---	---	---	---
80000Z 22.3N 132.0E	25 22.2N 132.3E	35 18 10	24.8N 129.0E	55 214 15	27.2N 126.1E	60 375 20	---	---	---	---	---	---	---	---
80600Z 24.6N 131.6E	40 22.9N 130.9E	50 109 0	25.5N 126.6E	60 203 20	---	---	---	---	---	---	---	---	---	---
81200Z 25.6N 130.0E	40 25.4N 130.3E	50 20 10	26.8N 124.8E	60 60 20	---	---	---	---	---	---	---	---	---	---
81800Z 26.6N 128.4E	40 26.8N 128.1E	50 20 10	31.3N 121.3E	40 128 0	---	---	---	---	---	---	---	---	---	---
90000Z 27.4N 126.8E	40 27.8N 126.7E	45 5 5	31.8N 120.9E	35 154 -5	---	---	---	---	---	---	---	---	---	---
90600Z 28.8N 125.7E	40 29.4N 125.4F	40 29 0	---	---	---	---	---	---	---	---	---	---	---	---
91200Z 29.8N 124.7E	40 30.1N 124.6E	40 19 0	---	---	---	---	---	---	---	---	---	---	---	---
91800Z 31.2N 123.8E	40 31.3N 123.4F	40 21 0	---	---	---	---	---	---	---	---	---	---	---	---
00000Z 33.0N 123.3E	40 33.0N 122.4E	35 45 -5	---	---	---	---	---	---	---	---	---	---	---	---

TROPICAL DEPRESSION 25  
1200Z 24 AUG TO 1800Z 25 AUG

BEST TRACK	WARNING	24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
		POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	
241200Z 27.7N 166.5E	25 20.0N 167.0E	30 105	5 26.0N 164.8E	45 239	15	--	--	--	--	--	--	--	--	--	--	--	--		
241800Z 28.2N 165.8E	25 26.0N 166.5E	30 137	5 26.0N 166.5E	45 378	15	--	--	--	--	--	--	--	--	--	--	--	--		
250000Z 28.7N 165.2E	25 28.7N 165.2E	30 0	5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
250600Z 29.1N 164.7E	30 29.2N 165.0E	30 17	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
251200Z 29.9N 163.5E	30 29.6N 164.7E	30 50	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
251800Z 31.2N 162.4E	30 30.0N 162.8E	20 41	-10 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

TROPICAL DEPRESSION 28  
1800Z 13 SEP TO 0000Z 14 SEP

BEST TRACK	WARNING	24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
		POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	
131800Z 25.0N 156.9E	25 21.0N 163.0E	30 444	5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
140000Z 26.6N 156.2E	25 22.0N 161.0E	30 379	5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

TROPICAL STORM CARMEN

0600Z 24 SEP TO 1200Z 26 SEP

BEST TRACK	WARNING	24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
		POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	
240600Z 18.7N 137.9E	25 18.3N 138.3E	30 33	5 19.7N 134.0E	45 214	15	--	--	--	--	--	--	--	--	--	--	--	--		
241200Z 19.6N 136.7E	25 19.1N 137.5E	30 54	5 20.3N 133.3E	45 291	15	--	--	--	--	--	--	--	--	--	--	--	--		
241800Z 20.7N 135.6E	25 21.0N 135.5E	25 19	0 23.2N 131.5E	40 318	5	--	--	--	--	--	--	--	--	--	--	--	--		
250000Z 21.0N 134.4E	25 23.0N 135.2E	30 127	5 27.1N 130.3E	45 343	-5	--	--	--	--	--	--	--	--	--	--	--	--		
250600Z 23.2N 133.2E	30 23.0N 132.5E	25 40	-5 25.7N 127.2E	35 697	-10	--	--	--	--	--	--	--	--	--	--	--	--		
251200Z 25.1N 132.4E	30 24.5N 132.4E	25 36	-5 28.8N 129.5E	35 643	-5	--	--	--	--	--	--	--	--	--	--	--	--		
251800Z 28.4N 132.8E	35 29.0N 133.8E	35 63	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
260000Z 31.0N 134.1E	50 31.7N 134.2E	50 8	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
260600Z 34.4N 136.2E	45 34.1N 136.3E	50 19	5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
261200Z 35.8N 139.2E	40 37.0N 140.5E	40 109	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

TROPICAL STORM GLORIA

0600Z 9 OCT TO 1800Z 10 OCT

BEST TRACK	WARNING	24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
		POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	
090600Z 13.8N 127.1E	40 13.0N 127.2E	45 13	5 14.1N 122.7E	60 177	20	--	--	--	--	--	--	--	--	--	--	--	--		
091200Z 14.5N 126.4E	40 13.7N 126.9E	45 56	5 14.0N 123.4E	60 217	25	--	--	--	--	--	--	--	--	--	--	--	--		
091800Z 15.3N 125.6E	40 14.8N 125.7E	45 30	5 16.7N 121.7E	50 67	20	--	--	--	--	--	--	--	--	--	--	--	--		
100000Z 16.1N 124.8E	45 16.1N 125.7E	40 52	-5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
100600Z 16.9N 123.7E	40 17.4N 123.8E	40 30	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
101200Z 17.5N 122.4E	35 17.0N 122.6E	35 21	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
101800Z 18.0N 121.0E	30 17.6N 121.3E	30 29	0 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

TROPICAL STORM JUNY

1800Z 15 NOV TO 0600Z 16 NOV

BEST TRACK	WARNING	24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
		POSIT	WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	
151800Z 5.5N 109.5E	45 5.5N 108.6E	50 54	5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
160000Z 5.4N 110.0E	40 5.7N 108.8E	55 74	15 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
160600Z 5.2N 110.5E	35 5.4N 110.7E	30 17	-5 --	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

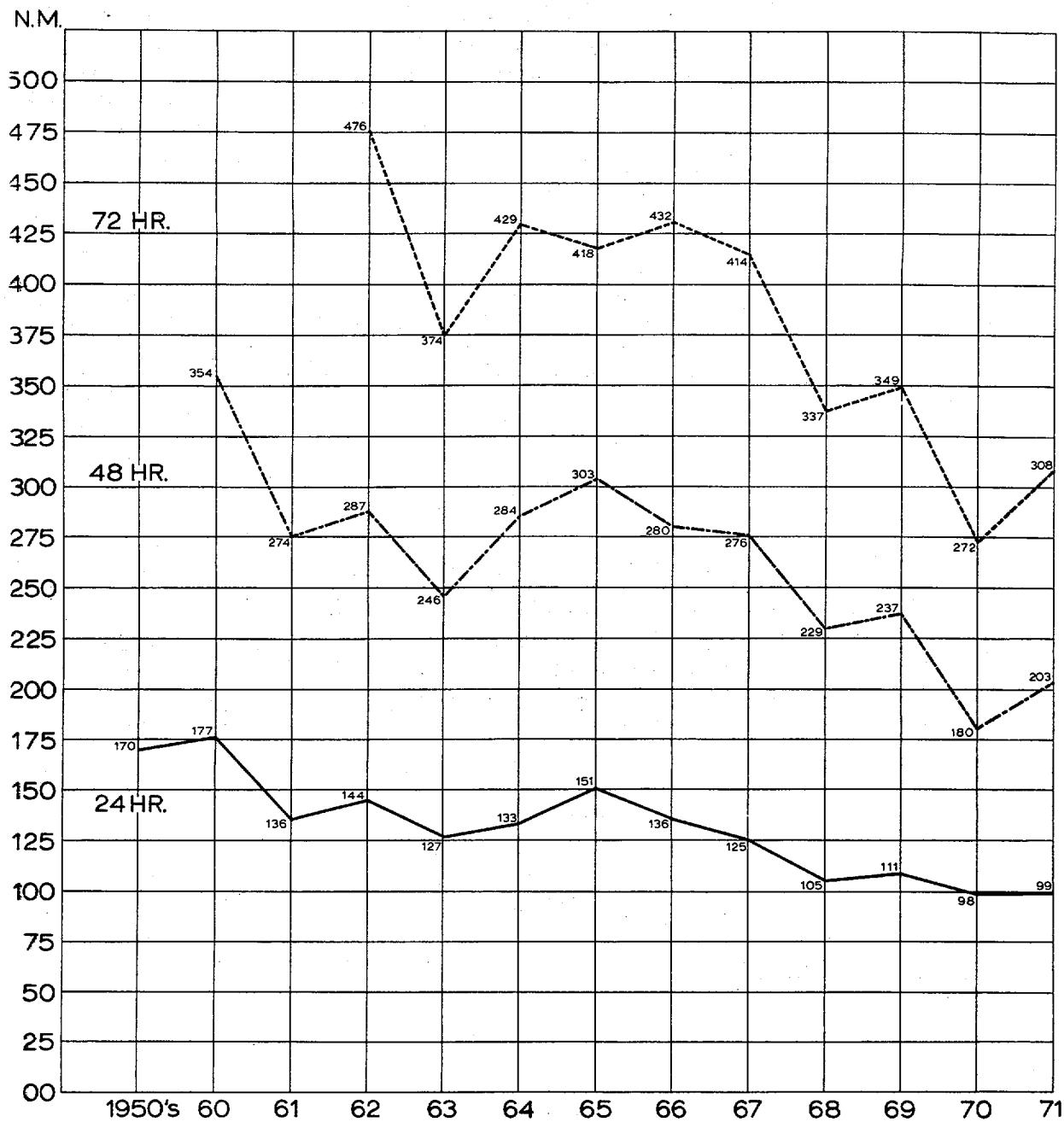


FIGURE 4-1. JTWC OFFICIAL FORECAST ACCURACY.

## JTWC FORECAST VERIFICATION

Forecast positions for the 24-, 48-, and 72-hour forecasts are verified only as long as the best track analysis estimates winds in excess of 33 kt for tropical cyclones which reach typhoon intensity.

In addition to this method of verifying absolute error distance, a computation of closest distance to the best track (right angle error) has been included to indicate the demonstrated ability to forecast the path of motion without regard to speed.

The following tables and figures are presented to graphically depict the distribution of forecasting error in JTWC forecasts.

TABLE 4-8. AVERAGE FORECAST ERROR (NAUTICAL MILES)

	<u>24 HR</u>	<u>48 HR</u>	<u>72 HR</u>
1950-58	170	---	---
1959	*117	*267	---
1960	177	354	---
1961	136	274	---
1962	144	287	476
1963	127	246	374
1964	133	284	429
1965	151	303	418
1966	136	280	432
1967	125	276	414
1968	105	229	337
1969	111	237	349
1970	98	181	272
1971	99	203	308

\*Forecast positions north of 35N were not verified.

TABLE 4-9. 1971 JOINT TYPHOON WARNING CENTER ERROR SUMMARY

(Average errors are given in nautical miles)

CYCLONE	WARNING			24 HOUR			48 HOUR			72 HOUR		
	POSIT ERROR	RT ANGLE ERROR	# WRNGS	FCST ERROR	RT ANGLE ERROR	CASES	FCST ERROR	RT ANGLE ERROR	CASES	FCST ERROR	RT ANGLE ERROR	CASES
1. T.S. SARAH	18	10	10	162	72	6	-	-	0	-	-	0
2. T.S. THELMA	49	25	6	201	111	2	-	-	0	-	-	0
3. T. VERA	19	15	33	122	81	25	204	133	17	229	189	6
4. T. WANDA	16	8	40	67	36	36	134	68	24	187	62	8
5. T. AMY	11	7	34	97	51	30	296	188	23	577	339	10
6. T.S. BABE	23	17	18	142	98	14	321	165	9	675	279	2
7. T.S. CARLA	15	8	15	125	112	9	313	188	6	-	-	0
8. T. DINAH	19	15	20	63	47	17	162	100	11	178	95	4
9. T.S. EMMA	46	20	5	142	22	1	-	-	0	-	-	0
10. T. FREDA	16	11	15	62	38	11	93	32	7	126	28	2
11. T. GILDA	16	10	16	86	62	12	199	143	8	236	180	2
12. T. HARRIET	13	10	20	109	67	16	264	154	12	361	184	4
13. T.S. IVY	25	17	11	205	80	7	427	52	3	-	-	0
14. T.S. KIM	30	15	18	118	49	14	107	69	3	-	-	0
15. T. JEAN	39	22	32	98	74	24	154	67	20	227	51	9
16. T. LUCY	12	7	26	52	20	22	105	44	17	167	69	7
17. T. MARY	42	35	15	181	126	11	179	108	7	-	-	0
18. T. NADINE	15	9	27	63	34	23	107	41	14	142	36	5
19. T. OLIVE	18	13	31	98	50	27	110	71	17	214	118	6
20. T.S. POLLY	29	18	21	165	74	13	428	92	2	-	-	0
21. T. ROSE	17	13	29	109	83	24	245	152	18	422	222	4
22. T. SHIRLEY	29	18	20	208	112	16	525	321	12	942	672	4
23. T. TRIX	15	9	43	83	51	39	149	107	32	253	200	14
24.	(CENTRAL PACIFIC HURRICANE CENTER)											
25. T.D.	58	43	6	308	136	2	-	-	0	-	-	0
26. T. VIRGINIA	22	17	23	94	65	19	217	152	13	382	250	5
27. T. WENDY	16	9	33	126	74	29	241	160	24	364	258	10
28. T.D.	412	384	2	-	-	0	-	-	0	-	-	0
29. T. AGNES	24	19	17	127	94	13	201	102	3	-	-	0
30. T. BESS	13	7	26	77	41	22	174	96	17	324	218	6
31. T.S. CARMEN	51	39	10	418	145	6	-	-	0	-	-	0
32. T. DELLA	30	22	15	73	60	12	123	78	8	142	62	2
33. T. ELAINE	22	13	26	103	63	22	227	70	17	268	69	7
34. T. FAYE	29	17	25	201	97	16	518	290	9	817	515	1
35. T.S. GLORIA	33	20	7	160	125	3	-	-	0	-	-	0
36. T. HESTER	17	10	18	120	41	13	265	103	8	495	131	2
37. T. IRMA	14	9	31	98	50	27	194	78	21	251	123	7
38. T.S. JUDY	48	38	3	-	-	0	-	-	0	-	-	0
ALL FORECASTS	22	15	747	111	64	583	212	118	382	317	177	127
*TYPHOONS	18	12	583	99	59	491	203	116	351	308	176	123

\*Includes only forecasts on cyclones that became typhoons and only when verifying best track wind was ≥ 35 Kts.

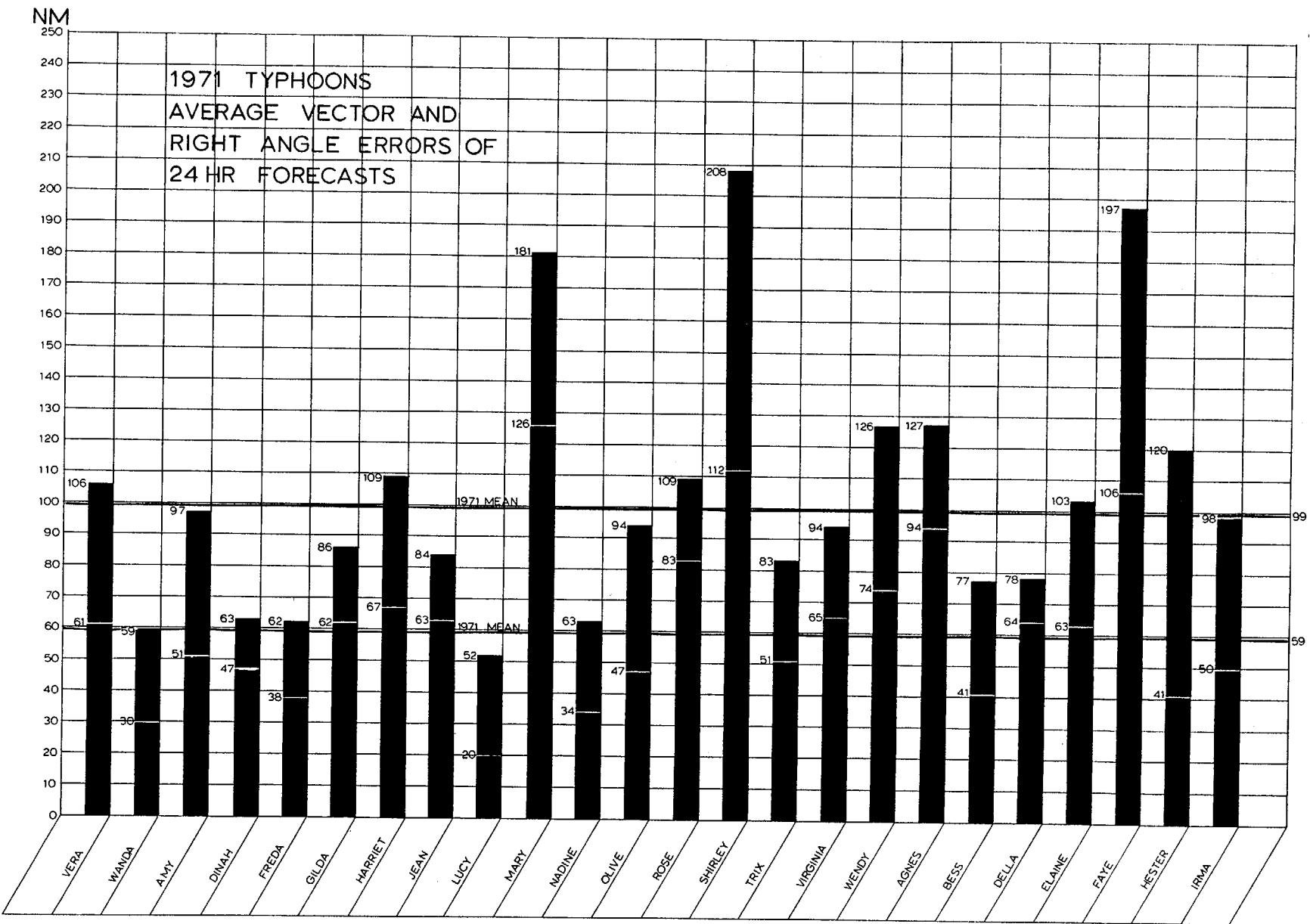


FIGURE 4-2. AVERAGE VECTOR AND RIGHT ANGLE ERRORS OF  
24 HR FORECASTS.

### RIGHT ANGLE ERROR

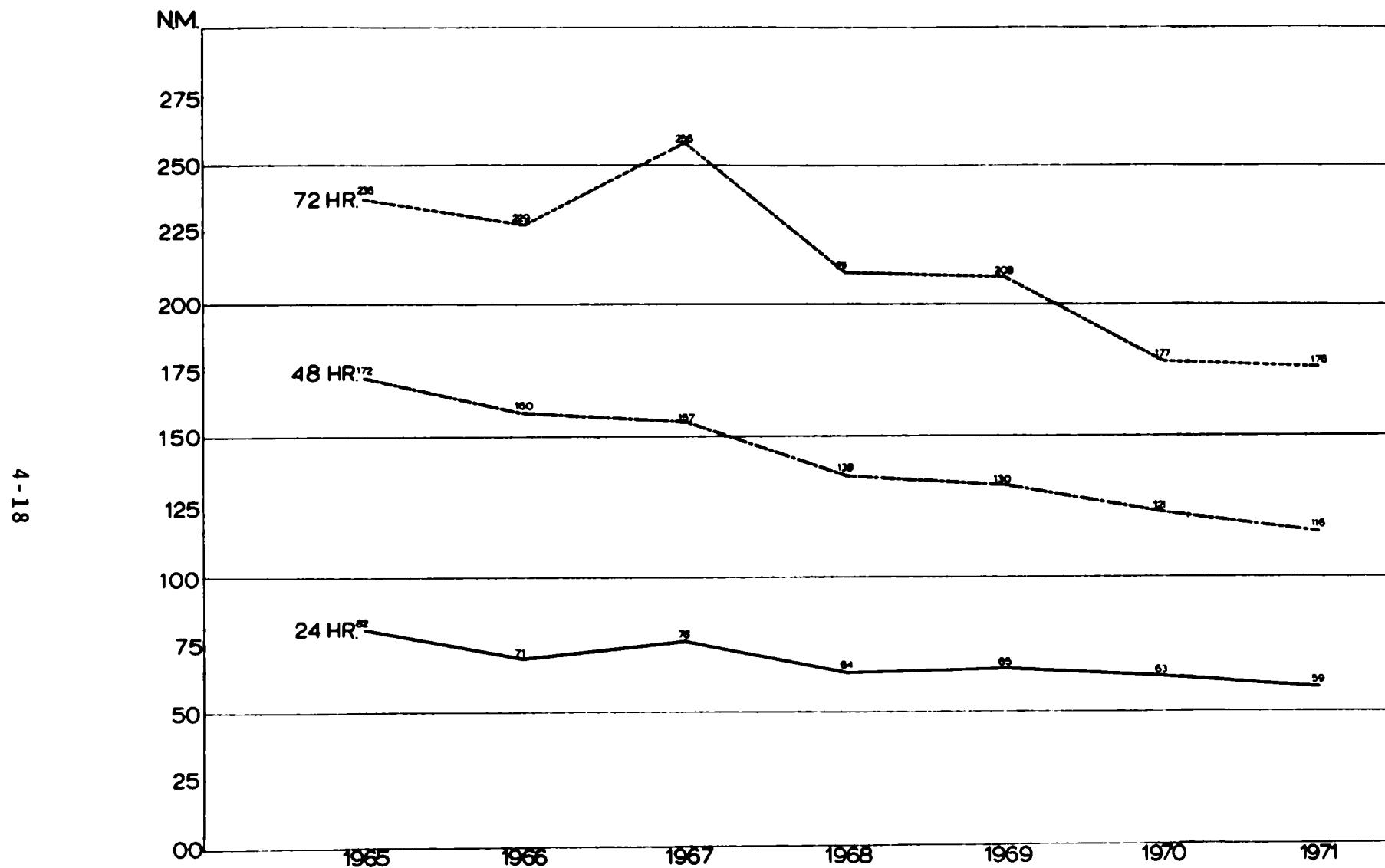


FIGURE 4-3. RIGHT ANGLE ERROR.

SUMMARY OF TROPICAL CYCLONE FORMATION ALERTS  
1971

The Tropical Cyclone Formation Alert message, in its second year of use, provided JTWC with a means to adequately warn DOD activities of potentially dangerous tropical disturbances which normally had not reached the tropical depression stage.

During 1971 there were 48 tropical disturbances for which alerts were issued. The total number of alerts, including extensions was 90. Fifteen alert systems were not subsequently placed in warning status. Thirty-three of the 37 tropical cyclones placed in warning status during 1971 were initially covered by formation alerts.

SUMMARY

	NO. OF ALERT SYSTEMS	ALERT SYSTEMS WHICH BECAME NUMBERED TROPICAL CYCLONES	TOTAL NUMBERED TROPICAL CYCLONES	DEVELOPMENT RATE
1970	32	18	27	56%
1971	48	33	37	69%

MONTHLY DISTRIBUTION

J	F	M	A	M	J	J	A	S	O	N	D
1	0	2	5	4	5	6	5	10	7	2	1

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