NOAA TECHNICAL MEMORANDUM NWS WR-150

ANNUAL DATA AND VERIFICATION TABULATION EASTERN AND CENTRAL NORTH PACIFIC TROPICAL CYCLONES 1979

Emil B. Gunther and Staff

National Weather Service Western Region
Salt Lake City, Utah
April 1980

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82 Flash Flood Forecasting and Warning Program in the Western Region. Philip Williams, Jr., Chester L. Glenn, and Roland L. Raetz, December 1972. (Rev. March 1978.) (COM-73-10251)
83 A Comparison of Manual and Semiautomatic Methods of Digitizing Analog Wind Records. Glenn E. Rasch, March 1973. (COM-73-10669)
84 Southwestern United States Summer Monsoon Source--Gulf of Mexico or Pacific Ocean? John E. Hales, Jr., March 1973. (COM-73-10769)
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87 A Refinement of the Use of K-Values in Forecasting Thunderstorms in Washington and Oregon. Robert Y. G. Lee, June 1973. (COM-73-11276)
89 Objective Forecast of Precipitation over the Western Region of the United States. Julia N. Paegle and Larry P. Kierulff, September 1973. (COM-73-11946/3AS)
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91 Arizona "Eddy" Tornadoes. Robert S. Ingram, October 1973. (COM-73-10465)

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Eastern Pacific Hurricane Center
Weather Service Forecast Office
San Francisco, California
April 1980

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Secretary

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
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National Weather
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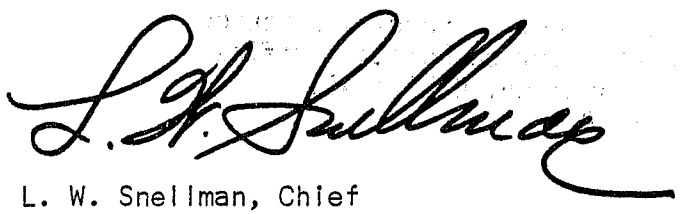
This Technical Memorandum has been reviewed and is approved for publication by Scientific Services Division, Western Region.



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ANNUAL DATA AND VERIFICATION TABULATION
EASTERN AND CENTRAL NORTH PACIFIC TROPICAL STORMS AND HURRICANES 1979

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I. INTRODUCTION

This is the first of an annual series covering eastern and central North Pacific tropical cyclone activity. The data included in this report are limited since the decision to prepare the report was not made until very late in the tropical cyclone season. Issuances in future years will contain additional data including satellite imagery.

Data for this publication were provided by the National Weather Service, the National Environmental Satellite Service Field Station - San Francisco, California, and the Chief, Aerial Reconnaissance Coordination, all Hurricanes (CARCAH), Miami, Florida.

II. OBJECTIVE FORECAST TECHNIQUES

Tropical cyclone prediction models used by Eastern Pacific Hurricane Center (EPHC) forecasters include:

1. EPHC-77 (Leftwich and Neumann: 1977). A Statistical-Synoptic Model.
2. EPCLIPER (Neumann: 1972). A Simulated Analog Model Based on Persistence and Climatology.
3. SANBAR (Sanders and Burpee: 1968). A Filtered Barotropic Model.
4. EPANALOG (Jarrell, Mauck, and Renard: 1975). An Analog Model.
5. NMC MFM (Hovermale: 1975). A Ten-Level Baroclinic Model.

In addition to the above models, Eastern Pacific Hurricane forecasters also make use of NMC analyses and prognoses.

III. VERIFICATION

Verification statistics for the 1979 season are shown in Table 1. The forecast displacement error is the vector difference between the forecast displacement and the actual displacement computed from best-track positions. The initial position error is not subtracted from the forecast error and depression stages of the storm are not verified. Table 2 gives a breakdown of the verification statistics of the official forecasts for each of the named storms. A more detailed verification will be presented in future years.

IV. DATA SUMMARIES

A summary of 1979 eastern and central North Pacific tropical cyclone statistics is given in Table 3. Best track, initial positions, and initial position errors are given in Table 4. Tracks of eastern North Pacific tropical cyclones are shown in Figures 1 and 2. There were no tropical cyclones in the central North Pacific during 1979.

Three reconnaissance flights, with a total of nine vortex penetrations, were made into eastern North Pacific tropical cyclone activity during the 1979 season. All of the flights were made by the U. S. Air Force and all were into Hurricane Ignacio off the central Mexican coast. Vortex data are given in Table 5.

V. REFERENCES

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TABLE 1

VERIFICATION OF 1979 TROPICAL STORM AND HURRICANE FORECASTS.
FIGURES IN PARENTHESES ARE NUMBER OF CASES.

METHOD	FORECAST DISPLACEMENT ERRORS (N.MI.)		
	24 HR	48 HR	72 HR
OFFICIAL	101 (119)	178 (62)	246 (33)
EPANALOG	95 (109)	178 (74)	218 (46)
EPHC-77	94 (104)	177 (71)	226 (43)
EPCLIPER	96 (112)	178 (77)	253 (47)
SANBAR	104 (35)	213 (23)	368 (14)

TABLE 2

VERIFICATION OF OFFICIAL FORECASTS FOR EACH NAMED STORM OF 1979.
FIGURES IN PARENTHESES ARE NUMBER OF CASES.

STORM	FORECAST DISPLACEMENT ERRORS (N.MI.)		
	24HR	48HR	72HR
ANDRES	150	206	--
	(10)	(2)	--
BLANCA	65	90	0
	(12)	(5)	(1)
CARLOS	209	--	--
	(1)	--	--
DOLORES	81	211	361
	(18)	(12)	(8)
ENRIQUE	69	146	199
	(21)	(16)	(12)
FEFA	116	215	357
	(11)	(6)	(2)
GUILLERMO	179	214	203
	(13)	(5)	(2)
HILDA	51	--	--
	(3)	--	--
IGNACIO	103	184	213
	(23)	(16)	(8)
JIMENA	65	--	--
	(7)	--	--

TABLE 3

Summary of Eastern and Central North Pacific Tropical Cyclones, 1979

NO.	NAME	CLASS	DATES	MAXIMUM SUSTAINED WINDS (KTS)	U.S. DAMAGE ($ MILLION)	DEATHS
1.	ONE	TD	31 MAY - 1 JUNE	25	*	*
2.	ANDRES	H	31 MAY - 4 JUNE	85		
3.	BLANCA	TS	21 - 25 JUNE	45		
4.	CARLOS	TS	14 - 16 JULY	45		
5.	FIVE	TD	16 JULY	30		
6.	DOLORES	H	17 - 23 JULY	105		
7.	ENRIQUE	H	17 - 24 AUGUST	125		
8.	FEFA	H	21 - 25 AUGUST	100		
9.	NINE	TD	4 SEPTEMBER	25		
10.	GUILLERMO	H	8 - 13 SEPTEMBER	65		
11.	HILDA	TS	4 - 6 OCTOBER	40		
12.	IGNACIO	H	23 - 30 OCTOBER	125		
13.	JIMENA	TS	15 - 18 NOVEMBER	55		

* There were no reports of damage or deaths during the 1979 eastern and central North Pacific tropical cyclone season.

TABLE 4

Eastern and Central North Pacific Tropical Storm and Hurricane best track, initial positions, and position errors for 1979.

Date/Time (GMT)	Best Track Lat.	Best Track Long.	Operational Position Lat.	Operational Position Long.	Position Error (N.MI.)
Hurricane Andres 31 May - 4 June					
3118	11.0	95.5	11.0	95.5	0.0
0100	11.0	96.2	11.0	97.5	76.6
0106	11.0	96.9	11.5	98.0	71.3
0112	11.3	97.6	12.0	95.0	158.5
0118	11.8	98.0	11.0	99.0	75.9
0200	12.3	98.5	11.0	98.4	78.2
0206	12.8	98.8	12.5	98.3	34.4
0212	13.4	99.0	12.5	97.5	103.0
0218	13.9	99.3	13.7	98.3	59.5
0300	14.6	99.5	14.0	98.0	94.3
0306	15.2	99.9	14.5	99.0	67.0
0312	15.9	100.2	15.3	99.0	78.1
0318	16.7	100.7	16.4	100.0	44.1
0400	17.1	101.5	17.1	101.5	0.0
0406	17.5	102.3	17.6	102.4	8.3
0412	18.2	103.2	18.0	103.0	16.6
			Mean vector error		60.4
			Number of cases		16.0
Tropical Storm Blanca 21 - 25 June					
2106	9.5	102.7	9.5	102.7	0.0
2112	9.3	104.2	9.5	104.5	21.4
2118	9.3	105.7	9.6	105.8	18.9
2200	9.3	107.0	9.5	107.2	16.9
2206	9.5	108.1	9.7	107.9	16.9
2212	9.6	109.1	9.6	109.0	5.9
2218	9.7	110.1	9.6	110.1	6.0
2300	10.0	111.1	9.6	111.0	24.7
2306	10.2	112.0	9.8	111.9	24.7
2312	10.3	113.3	10.0	113.0	25.3
2318	10.7	114.4	10.5	114.2	16.8
2400	11.2	115.6	10.8	115.2	33.6
2406	11.3	116.9	10.9	116.5	33.6
2412	11.5	118.2	11.5	118.5	17.6
2418	11.8	119.5	11.2	119.5	36.0
2500	12.5	121.0	12.5	121.0	0.0
2506	12.8	122.8	13.0	123.2	26.3
2512	13.3	124.9	13.8	125.3	38.0
			Mean vector error		20.1
			Number of cases		18.0

Table 4 (continued)

Date/Time (GMT)	Best Track Lat.	Best Track Long.	Operational Position Lat.	Operational Position Long.	Position Error (N.MI.)
Tropical Storm Carlos 14 - 16 July					
1418	17.0	103.5	17.0	103.5	0.0
1500	17.4	104.4	17.5	104.1	18.2
1506	17.7	105.5	17.5	105.2	20.9
1512	17.9	106.9	17.8	106.4	29.2
1518	18.3	108.5	18.3	108.5	0.0
1600	18.5	110.3	18.5	110.4	5.7
1606	18.5	113.0	18.5	114.0	56.7
			Mean vector error		18.7
			Number of cases		7.0
Hurricane Dolores 17 - 23 July					
1706	10.5	103.7	10.4	103.7	6.0
1712	10.9	105.3	11.0	105.5	13.2
1718	11.2	107.0	11.1	106.8	13.2
1800	11.0	108.9	11.4	108.7	26.7
1806	11.2	110.2	11.2	110.2	0.0
1812	11.8	111.4	11.4	111.5	24.7
1818	12.4	112.6	12.4	112.6	0.0
1900	12.5	113.8	12.5	113.6	11.7
1906	12.8	114.8	12.5	114.8	18.0
1912	13.2	115.5	13.4	115.5	12.0
1918	13.7	116.0	13.5	115.8	16.7
2000	14.0	116.5	13.8	116.5	12.0
2006	14.6	117.1	14.6	117.1	0.0
2012	15.3	117.7	15.3	117.6	5.8
2018	16.0	118.2	16.0	118.2	0.0
2100	16.9	118.9	16.8	118.8	8.3
2106	17.7	119.7	17.5	119.5	16.6
2112	18.4	120.4	18.5	120.5	8.3
2118	19.2	121.3	19.2	121.3	0.0
2200	20.3	121.8	20.3	121.8	0.0
2206	21.3	122.6	21.3	122.5	5.6
2212	22.2	123.5	22.4	123.6	13.2
2218	23.3	124.2	23.3	124.2	0.0
2300	24.2	125.1	24.1	125.0	8.1
2306	25.2	125.9	25.5	126.0	18.8
2312	26.3	126.4	27.2	126.0	58.1
2318	27.3	127.0	27.0	126.8	20.9
			Mean vector error		11.8
			Number of cases		27.0

Table 4 (continued)

Date/Time (GMT)	Best Track Lat.	Best Track Long.	Operational Position Lat.	Operational Position Long.	Position Error (N.MI.)
Hurricane Enrique 17 - 24 August					
1718	11.2	113.8	11.5	113.5	25.2
1800	11.2	114.9	11.7	114.5	38.1
1806	11.7	115.9	11.8	115.4	30.0
1812	12.2	116.9	11.8	116.5	33.6
1818	12.8	117.9	12.3	117.4	41.9
1900	12.8	119.0	12.7	118.8	13.2
1906	12.9	120.0	13.0	120.5	29.8
1912	13.0	121.0	13.1	121.5	29.8
1918	13.1	122.0	13.2	122.2	13.1
2000	13.4	122.9	13.4	123.0	5.8
2006	13.8	123.8	13.6	123.6	16.7
2012	14.2	124.5	14.0	124.5	12.0
2018	14.6	125.0	14.2	125.0	24.0
2100	14.9	125.6	14.8	125.3	18.4
2106	15.4	126.0	15.2	125.5	31.3
2112	15.9	126.4	16.0	126.2	13.0
2117	16.4	126.7	16.2	126.7	12.0
2118	16.5	126.8	16.5	126.8	0.0
2200	17.0	127.5	17.0	127.5	0.0
2206	17.6	128.3	17.6	128.3	0.0
2212	18.2	129.2	18.2	129.4	11.4
2218	18.9	129.9	19.0	130.0	8.3
2300	19.6	130.7	19.6	130.7	0.0
2306	20.1	131.3	19.9	131.4	13.3
2312	20.4	132.0	20.8	132.6	41.4
2318	20.8	132.7	20.8	132.7	0.0
2400	21.1	133.5	21.1	133.4	5.6
2406	21.1	134.4	21.1	134.5	5.6
2412	21.2	135.1	21.0	135.5	25.4
2418	21.3	135.8	21.0	136.0	21.2
			Mean vector error		17.3
			Number of cases		30.0
Hurricane Fefa 21 - 25 August					
2100	13.9	101.8	13.8	101.3	29.7
2106	14.2	103.1	14.0	102.5	36.9
2112	14.8	104.5	14.7	104.5	6.0
2118	15.3	106.1	15.2	105.8	18.4
2200	15.6	108.0	15.7	107.8	13.0
2206	15.8	109.6	15.8	109.6	0.0
2212	16.2	111.0	15.9	111.0	18.0
2218	16.7	112.2	16.7	112.2	0.0
2300	16.9	114.0	16.9	114.0	0.0

Table 4 (continued)

Date/Time (GMT)	Best Track Lat.	Best Track Long.	Operational Position Lat.	Operational Position Long.	Position Error (N.MI.)
Hurricane Fefa continued.					
2306	17.5	115.8	17.5	115.8	0.0
2312	17.8	117.8	17.8	117.5	17.1
2318	17.8	119.8	17.8	119.5	17.1
2400	17.9	120.8	17.8	121.1	18.2
2406	18.0	121.4	17.9	124.0	148.5
2412	18.1	122.1	17.5	125.5	197.5
2418	18.2	122.7	18.2	122.7	0.0
2500	18.4	123.3	18.5	123.2	8.3
				Mean vector error	31.1
				Number of cases	17.0
Hurricane Guillermo 8 - 13 September					
0818	16.0	101.0	15.5	99.4	97.1
0900	16.3	102.5	15.0	102.0	83.2
0906	16.8	103.9	15.6	103.0	88.7
0912	17.3	105.2	15.6	103.0	162.6
0918	17.8	106.2	17.0	107.0	66.3
1000	18.3	106.8	19.0	107.0	43.5
1006	18.9	107.4	20.3	110.3	184.2
1012	19.5	108.0	19.5	109.5	84.8
1018	20.1	108.9	20.0	109.0	8.2
1100	20.6	109.7	20.4	109.4	20.7
1106	20.8	109.9	20.7	110.1	12.7
1112	20.9	110.3	21.7	109.9	53.0
1118	21.1	110.5	21.4	110.6	18.8
1200	21.6	110.6	21.4	110.9	20.6
1206	21.6	110.6	21.4	111.2	35.6
1212	21.6	110.6	21.4	111.0	25.3
1218	21.6	110.6	21.5	110.5	8.2
1300	21.6	110.6	21.5	110.5	8.2
1306	21.6	110.6	21.5	110.5	8.2
1312	21.6	110.6	21.7	110.4	12.7
				Mean vector error	52.1
				Number of cases	20.0
Tropical Storm Hilda 4 - 6 October					
0400	13.0	104.0	13.0	103.8	11.7
0406	13.2	105.3	12.9	104.7	39.4
0412	13.5	106.7	13.5	106.1	35.0
0418	13.8	108.0	13.8	108.5	29.1
0500	14.2	109.2	14.2	109.2	0.0
0506	14.6	110.4	14.7	110.4	6.0

Table 4 (continued)

Date/Time (GMT)	Best Track Lat.	Best Track Long.	Operational Position Lat.	Operational Position Long.	Position Error (N.MI.)
Tropical Storm Hilda continued.					
0512	14.8	111.7	14.8	111.0	40.6
0518	15.0	112.9	15.0	111.8	63.8
0600	15.1	114.2	15.1	114.2	0.0
0606	15.3	115.3	15.1	115.1	16.7
0612	15.5	116.7	15.1	116.0	47.1
0618	15.8	118.0	15.3	117.4	45.9
			Mean vector error		27.9
			Number of cases		12.0
Hurricane Ignacio 23 - 30 October					
2318	11.7	95.3	11.7	95.3	0.0
2400	11.6	96.2	12.3	96.8	54.8
2406	11.6	97.1	12.6	97.5	64.4
2412	11.5	97.9	12.4	98.1	55.3
2418	11.5	98.8	11.5	98.8	0.0
2500	11.7	99.7	11.7	99.7	0.0
2506	11.9	100.5	11.7	100.1	26.4
2512	12.5	101.2	12.0	100.4	55.7
2518	13.0	102.0	12.5	101.5	41.9
2600	13.5	102.7	12.7	102.0	63.1
2606	14.2	103.2	13.6	102.7	46.3
2612	14.8	103.7	14.8	103.7	0.0
2618	15.3	104.3	15.3	104.3	0.0
2700	15.9	105.0	15.9	105.0	0.0
2706	16.4	105.7	16.3	105.7	6.0
2712	16.8	106.4	16.8	106.3	5.7
2718	17.0	107.3	17.0	107.3	0.0
2800	17.1	107.6	17.1	107.6	0.0
2806	17.0	108.0	17.0	108.0	0.0
2812	17.4	108.0	16.9	108.1	30.5
2818	17.7	108.1	17.7	108.0	5.7
2900	18.0	107.9	18.0	107.9	0.0
2906	18.0	107.3	17.9	107.9	34.8
2912	18.0	106.6	17.9	107.3	40.4
2918	18.1	105.8	18.0	106.0	12.9
3000	18.1	105.0	18.1	105.2	11.4
3006	18.0	103.8	17.8	104.3	31.0
3012	18.0	102.3	18.0	102.5	11.4
			Mean vector error		21.3
			Number of cases		28.0

Table 4 (continued)

Date/Time (GMT)	Best Track Lat.	Best Track Long.	Operational Position Lat.	Operational Position Long.	Position Error (N.MI.)
Tropical Storm Jimena 15 - 18 November					
1506	8.5	88.0	8.5	88.0	0.0
1512	8.5	89.0	8.5	88.5	29.7
1518	8.5	90.0	8.5	88.9	65.3
1521	8.5	90.5	8.5	91.0	14.8
1600	8.5	91.0	8.5	91.0	0.0
1606	8.7	92.0	8.7	92.0	0.0
1612	9.0	93.0	9.0	93.0	0.0
1618	9.4	94.1	9.4	94.1	0.0
1700	10.2	94.8	10.2	94.8	0.0
1706	10.8	95.7	10.9	95.5	13.2
1712	10.9	96.7	11.2	96.3	29.6
1718	10.9	97.8	11.0	97.8	6.0
1800	10.8	98.7	10.8	98.6	5.9
1806	10.8	99.6	10.8	99.8	11.8
				Mean vector error	12.6
				Number of cases	14.0

TABLE 5

EASTERN AND CENTRAL NORTH PACIFIC
AIRCRAFT RECONNAISSANCE
VORTEX DATA
1979

DATE	TIME (GMT)	POSITION	UNIT	CHARACTER*	MAX WIND FLT LVL	(KT) SFC	ACFT ALT	MINIMUM PRESS (MB)	700MB HT(M)	TEMP(°C) IN	TEMP(°C) OUT	EYE C=CIR. DIA. E=ELIP(NMI)	REMARKS
27	1742	17.0 107.3	AF	2/3	109	125	700MB	938	2553	16	12	C20	CLOSED WALL.
27	1930	17.0 107.5	AF	2/3	91	125	700MB	937	2550	16	11	C20	CLOSED WALL.
27	2022	17.0 107.5	AF	2/3	94	125	700MB	---	2550	16	10	C20	CLOSED WALL.
28	1755	17.7 108.1	AF	5/2	70	---	700MB	969	2799	13	11	C05	CLOSED WALL.
28	2022	17.8 108.1	AF	5/3	83	---	700MB	970	2789	12	09	C05	CLOSED WALL.
29	2137	18.3 105.8	AF	2/5	52	55	700MB	995	3026	13	11	C20	POORLY DEFINED.
29	2252	18.3 105.6	AF	2/5	69	50	700MB	997	3033	11	10	C20	OPEN N AND S.
30	0003	18.2 105.4	AF	3/5	55	55	700MB	---	3036	11	10	C20	OPEN E-S-W.
30	0038	18.3 105.3	AF	3/5	85	50	700MB	---	3036	12	11	C20	POORLY DEFINED.

*NAVIGATION FIX ACCURACY/METEOROLOGICAL ACCURACY (Nautical Miles).

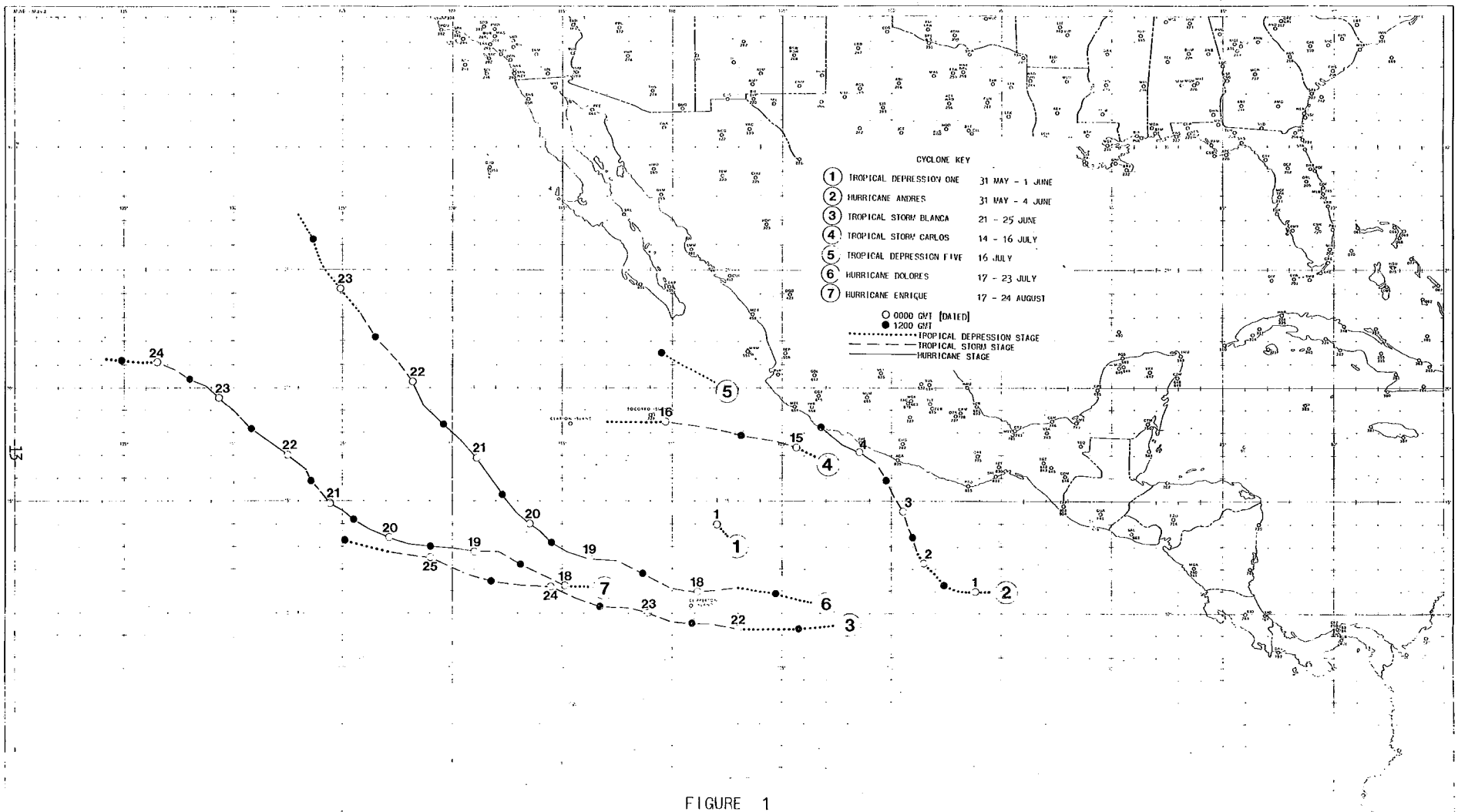
CYCLONE KEY
1 TROPICAL DEPRESSION ONE 31 MAY - 1 JUNE
2 HURRICANE ANDRES 31 MAY - 4 JUNE
3 TROPICAL STORM BLANCA 21 - 25 JUNE
4 TROPICAL STORM CARLOS 14 - 16 JULY
5 TROPICAL DEPRESSION FIVE 16 JULY
6 HURRICANE DOLORES 17 - 23 JULY
7 HURRICANE ENRIQUE 17 - 24 AUGUST
0000 GMT (DATED)
1200 GMT
TROPICAL DEPRESSION STAGE
TROPICAL STORM STAGE
HURRICANE STAGE

FIGURE 1

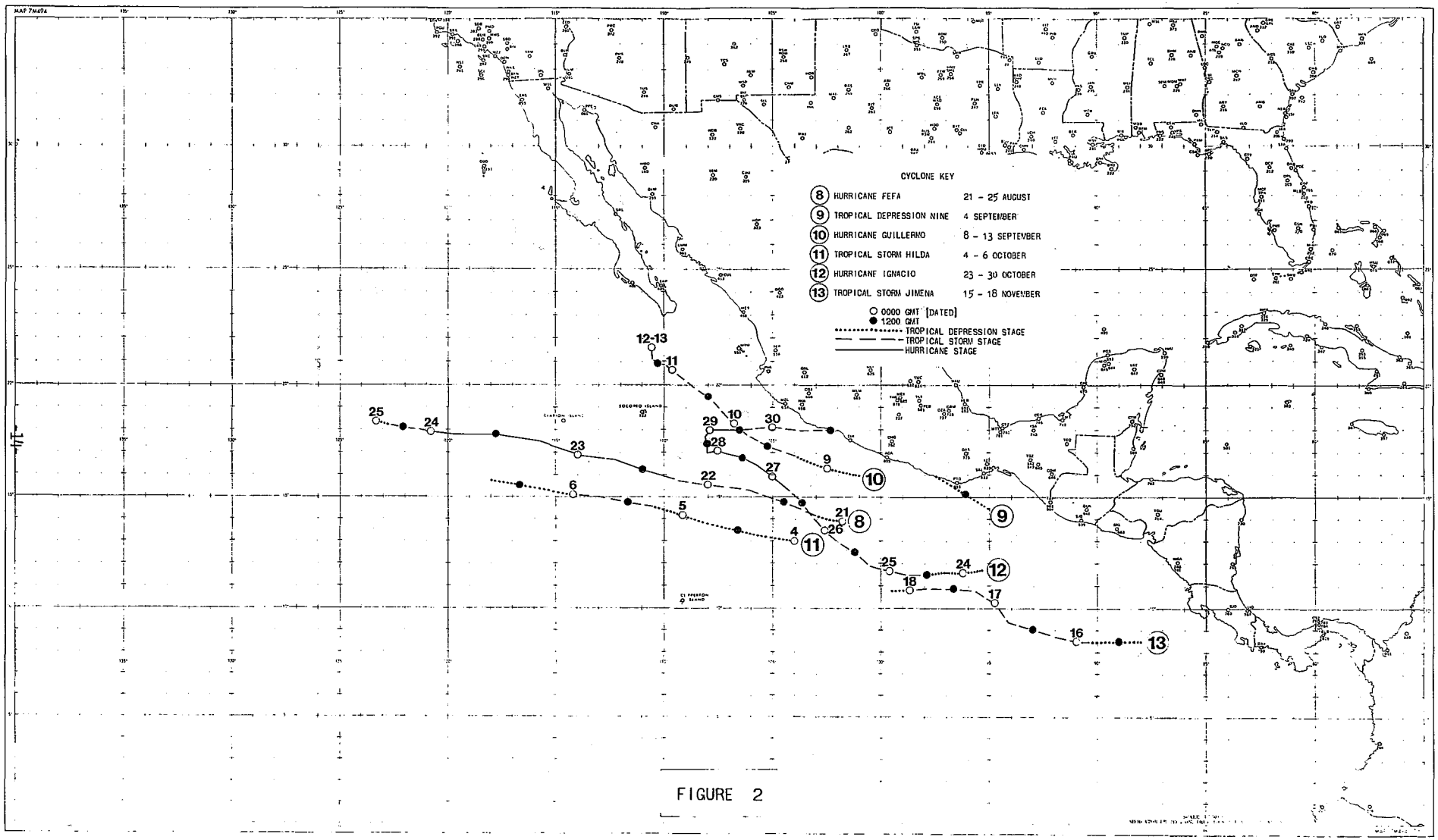
CYCLONE KEY
8 HURRICANE FEFA 21 - 25 AUGUST
9 TROPICAL DEPRESSION NINE 4 SEPTEMBER
10 HURRICANE GUILLERMO 8 - 13 SEPTEMBER
11 TROPICAL STORM HILDA 4 - 6 OCTOBER
12 HURRICANE IGNACIO 23 - 30 OCTOBER
13 TROPICAL STORM JIMENA 15 - 18 NOVEMBER
0000 GMT [DATED]
1200 GMT
TROPICAL DEPRESSION STAGE
TROPICAL STORM STAGE
HURRICANE STAGE

FIGURE 2

NOAA Technical Memoranda NWSWR: (Continued)

92 Smoke Management in the Willamette Valley. Earl M. Bates, May 1974. (COM-74-11277/AS)
93 An Operational Evaluation of 500-mb Type Regression Equations. Alexander E. MacDonald, June 1974. (COM-74-11407/AS)
94 Conditional Probability of Visibility Less than One-Half Mile in Radiation Fog at Fresno, California. John D. Thomas, August 1974. (COM-74-11555/AS)
96 Map Type Precipitation Probabilities for the Western Region. Glenn E. Rasch and Alexander E. MacDonald, February 1975. (COM-75-10428/AS)
97 Eastern Pacific Cut-off Low of April 21-28, 1974. William J. Alder and George R. Miller, January 1976. (PB-250-711/AS)
98 Study on a Significant Precipitation Episode in Western United States. Ira S. Brenner, April 1976. (COM-75-10719/AS)
99 A Study of Flash Flood Susceptibility--A Basin in Southern Arizona. Gerald Williams, August 1975. (COM-75-11360/AS)
102 A Set of Rules for Forecasting Temperatures in Napa and Sonoma Counties. Wesley L. Tuft, October 1975. (PB-246-902/AS)
103 Application of the National Weather Service Flash-Flood Program in the Western Region. Gerald Williams, January 1976. (PB-253-053/AS)
104 Objective Aids for Forecasting Minimum Temperatures at Reno, Nevada, During the Summer Months. Christopher D. Hill, January 1976. (PB-252-866/AS)
105 Forecasting the Mono Wind. Charles P. Ruscha, Jr., February 1976. (PB-254-650)
106 Use of MOS Forecast Parameters in Temperature Forecasting. John C. Plankinton, Jr., March 1976. (PB-254-649)
107 Map Types as Aids in Using MOS PoPs in Western United States. Ira S. Brenner, August 1976. (PB-259-594)
108 Other Kinds of Wind Shear. Christopher D. Hill, August 1976. (PB-260-437/AS)
109 Forecasting North Winds in the Upper Sacramento Valley and Adjoining Forests. Christopher E. Fontana, Sept. 1976. (PB-273-677/AS)
110 Cool Inflow as a Weakening Influence on Eastern Pacific Tropical Cyclones. William J. Denney, November 1976. (PB-264-655/AS)
112 The MAN/MOS Program. Alexander E. MacDonald, February 1977. (PB-265-941/AS)
113 Winter Season Minimum Temperature Formula for Bakersfield, California, Using Multiple Regression. Michael J. Oard, February 1977. (PB-273-694/AS)
114 Tropical Cyclone Kathleen. James R. Fors, February 1977. (PB-273-676/AS)
116 A Study of Wind Gusts on Lake Mead. Bradley Colman, April 1977. (PB-268-847)
117 The Relative Frequency of Cumulonimbus Clouds at the Nevada Test Site as a Function of K-value. R. F. Quiring, April 1977. (PB-272-831)
118 Moisture Distribution Modification by Upward Vertical Motion. Ira S. Brenner, April 1977. (PB-268-740)
119 Relative Frequency of Occurrence of Warm Season Echo Activity as a Function of Stability Indices Computed from the Yucca Flat, Nevada, Rawinsonde. Darryl Randerson, June 1977. (PB-271-290/AS)
121 Climatological Prediction of Cumulonimbus Clouds in the Vicinity of the Yucca Flat Weather Station. R. F. Quiring, June 1977. (PB-271-704/AS)
122 A Method for Transforming Temperature Distribution to Normality. Morris S. Webb, Jr., June 1977. (PB-271-742/AS)
124 Statistical Guidance for Prediction of Eastern North Pacific Tropical Cyclone Motion - Part I. Charles J. Neumann and Preston W. Leftwich, August 1977. (PB-272-661)
125 Statistical Guidance on the Prediction of Eastern North Pacific Tropical Cyclone Motion - Part II. Preston W. Leftwich and Charles J. Neumann, August 1977. (PB-273-155/AS)
127 Development of a Probability Equation for Winter-Type Precipitation Patterns in Great Falls, Montana. Kenneth B. Mielke, February 1978. (PB-281-387/AS)
128 Hand Calculator Program to Compute Parcel Thermal Dynamics. Dan Gudgel, April 1978. (PB-283-080/AS)
129 Fire Whirls. David W. Goens, May 1978. (PB-283-866/AS)
130 Flash-Flood Procedure. Ralph C. Hatch and Gerald Williams, May 1978. (PB-286-014/AS)
131 Automated Fire-Weather Forecasts. Mark A. Mollner and David E. Olsen, September 1978. (PB-289-916/AS)
132 Estimates of the Effects of Terrain Blocking on the Los Angeles WSR-74C Weather Radar. R. G. Pappas, R. Y. Lee, and B. W. Finke, October 1978. (PB289767/AS)
133 Spectral Techniques in Ocean Wave Forecasting. John A. Jannuzzi, October 1978. (PB291317/AS)
134 Solar Radiation. John A. Jannuzzi, November 1978. (PB291195/AS)
135 Application of a Spectrum Analyzer in Forecasting Ocean Swell in Southern California Coastal Waters. Lawrence P. Kieruliff, January 1979. (PB292716/AS)
136 Basic Hydrologic Principles. Thomas L. Dietrich, January 1979. (PB292247/AS)
137 LFM 24-Hour Prediction of Eastern Pacific Cyclones Refined by Satellite Images. John R. Zimmerman and Charles P. Ruscha, Jr., January 1979. (PB294324/AS)
138 A Simple Analysis/Diagnosis System for Real Time Evaluation of Vertical Motion. Scott Heflick and James R. Fors, February 1979. (PB294216/AS)
139 Aids for Forecasting Minimum Temperature in the Wenatchee Frost District. Robert S. Robinson, April 1979.(PB298339/AS)
140 Influence of Cloudiness on Summertime Temperatures in the Eastern Washington Fire Weather District. James Holcomb, April 1979. (PB298674/AS)
141 Comparison of LFM and MFM Precipitation Guidance for Nevada During Doreen. Christopher Hill, April 1979.(PB298613/AS)
142 The Usefulness of Data from Mountaintop Fire Lookout Stations in Determining Atmospheric Stability. Jonathan W. Corey, April 1979. (PB298899/AS)
143 The Depth of the Marine Layer at San Diego as Related to Subsequent Cool Season Precipitation Episodes in Arizona. Ira S. Brenner, May 1979. (PB298817/AS)
144 Arizona Cool Season Climatological Surface Wind and Pressure Gradient Study. Ira S. Brenner, May 1979. (PB298900/AS)
145 On the Use of Solar Radiation and Temperature Models to Estimate the Snap Bean Maturity Date in the Willamette Valley. Earl M. Bates, August 1979
146 The BART Experiment. Morris S. Webb, October 1979.
147 Occurrence and Distribution of Flash Floods in the Western Region. Thomas L. Dietrich, December 1979.
148 A Real-Time Radar Interface for AFOS. Mark Mathewson, January 1980.
149 Misinterpretations of Precipitation Probability Forecasts. Allan H. Murphy, Sarah Lichtenstein, Baruch Fischhoff, and Robert L. Winkler, February 1980.

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