

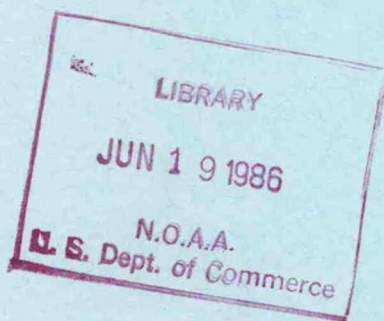
H
QC
995
U66
no.31

NOAA TECHNICAL MEMORANDUM NWSTM PR-31



1985 TROPICAL CYCLONES - CENTRAL NORTH PACIFIC

Honolulu, HI
May 1986



**U.S. DEPARTMENT OF
COMMERCE**

National Oceanic and
Atmospheric Administration

National Weather
Service

NOAA TECHNICAL MEMORANDA
National Weather Service, Pacific Region Subseries

The Technical Memoranda series provides an informal medium for the documentation and quick dissemination of results not appropriate, or not yet ready, for formal publication in the standard journals. The series is used to report on work in progress, to describe technical procedures and practices, or to report on investigations devoted primarily to regional and local problems of interest mainly to Pacific Region personnel and, hence, will not be widely distributed.

Papers 1 and 2 are in the former series, ESSA Technical Memoranda, Pacific Region Technical Memoranda (PRTM); papers 3-8 are in the former series, ESSA Technical Memoranda, Weather Bureau Technical Memoranda (WBTM); and papers 9-30 are part of the series, NOAA Technical Memoranda NWS.

Papers 1-3 are available from the Pacific Region Headquarters, Attention: TSD, P. O. Box 50027, Honolulu, HI 96850. Beginning with 4, the papers are available from the National Technical Information Service, U. S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22151. Prices vary for paper copy and microfiche. Order by accession number, when given, in parentheses at the end of each entry.

- No. 1 The Trade Wind Regime of Central and Western Maui. Carl M. Peterson. January 1966.
- No. 2 A Meteorological Glossary of Terms Used by Forecasters in Hawaii (Revised). R. F. Shaw. November 1967.
- No. 3 Utilization of Aircraft Meteorological Reports at WBFC Honolulu. E. M. Chadsey, P. R. Moore, R. E. Rush, J. E. Smith, J. Vederman. June 1967.
- No. 4 Tropical Numerical Weather Prediction in Hawaii - A Status Report. E. M. Carlstead. November 1967. (PB-183-621)
- No. 5 A Computer Method to Generate and Plot Streamlines. Roger A. Davis. February 1969. (PB-183-622)
- No. 6 Verification of an Objective Method to Forecast Frontal Passages in the Hawaiian Islands. E. M. Carlstead. September 1969.
- No. 7 Meteorological Characteristics of the Cold January 1969 in Hawaii. Richard I. Sasaki. November 1969. (PB-188-040)
- No. 8 Giant Waves Hit Hawaii. Jack D. Bottoms. September 1970. (COM-71-00021)
- No. 9 Tropical Numerical Weather Prediction in Hawaii - 1971. E. M. Carlstead. March 1971. (COM-71-00494)
- No. 10 Climatology of Rainfall Probabilities for Oahu, Hawaii. A. N. Hull and Jon Pitko. April 1972. (COM-73-10242)
- No. 11 A Cirrus Climatology for Honolulu. Clarence B. H. Lee and Wesley Young. April 1974. (COM-74-11244)
- No. 12 Straight Line Wind Variability Over Selected Stations on Leeward Oahu. Michael J. Morrow. July 1974. (COM-74-11669)

H
QC
995
U66
no.31

NOAA TECHNICAL MEMORANDUM NWSTM PR-31

11 1985 TROPICAL CYCLONES - CENTRAL NORTH PACIFIC

Wyman Au
Andrew Chun
Lonnie Iwai
Hans Rosendal
Tracy Yamashiroya

Honolulu, HI
May 1986

TABLE OF CONTENTS

1985 TROPICAL CYCLONES - Central Pacific

1. Central North Pacific Tropical Cyclone Data, 1985	1
2. Tropical Depression Enrique	2
3. Tropical Depression Enrique - Best Track Map	3
4. Hurricane Ignacio	4, 5
5. GOES-West Imagery of Hurricane Ignacio - 23 Jul 85	6
6. Hurricane Ignacio - Best Track Map	7
7. Hurricane Ignacio - Verification	8 - 12
8. Tropical Storm Linda	13
9. Tropical Storm Linda - Best Track Map	14
10. Tropical Depression 01C	15
11. Tropical Depression 01C - Best Track Map	16
12. Tropical Depression 02C/Typhoon Skip	17
13. Tropical Depression 02C/Typhoon Skip - Best Track Map	18
14. Hurricane Pauline	19
15. Hurricane Pauline - Best Track Map	20
16. GOES-West Imagery of Hurricane Pauline - 6 Sep 85	21
17. Hurricane Pauline - Verification	22 - 26
18. GOES-West Imagery of T.D. Pauline and Hurricane Rick 9 Sep 85	27
19. Hurricane Rick	28
20. Hurricane Rick - Best Track Map	29
21. GOES-West Imagery of Hurricane Rick - 10 Sep 85	30
22. Hurricane Rick - Verification	31 - 34
23. Hurricane Nele	35, 36
24. GOES-West Imagery of Hurricane Nele - 26 Oct 85	37
25. GOES-West Imagery of Hurricane Nele - 28 Oct 85	38

26. Hurricane Nele - Best Track Map	39
27. Hurricane Nele - Verification	40 - 44
28. Annual Verification Summary	45

CENTRAL NORTH PACIFIC TROPICAL CYCLONE DATA, 1985¹

<u>NAME</u>	<u>DATES</u>	<u>MAXIMUM CLASS</u>	<u>MAXIMUM SUSTAINED WINDS (KT)</u>	<u>LOWEST PRESSURE (MB)</u>	<u>TOTAL HOURS OBSERVED</u>
ENRIQUE	Ju1 1-5	Tropical Depression	E25 (SFSS)	N/A	102(TD)
IGNACIO	Ju1 21-26	Hurricane	E115 (SFSS, RECCE)	960 (RECCE)	72(H), 30(TS), 6(TD)
LINDA	Aug 4-8	Tropical Storm	E40 (SFSS)	N/A	30(TS), 79(TD)
O1C	Aug 20-21	Tropical Depression	E25 (SFSS)	N/A	30(TD)
O2C (SKIP) ²	Aug 30 - Sep 8	Tropical Storm	E70 (JTWC, RECCE)	N/A	6(TS), 6(TD)
PAULINE	Sep 5-9	Hurricane	E75 (SFSS, RECCE)	973 (RECCE)	66(H), 18(TS), 12(TD)
RICK	Sep 9-11	Hurricane	E125 (SFSS)	N/A ³	42(H), 12(TS), 6(TD)
NELE	Oct 23-29	Hurricane	E80 (SFSS, RECCE)	978 (RECCE)	108(H), 42(TS), 6(TD)

Key

H Hurricane

TS Tropical Storm

TD Tropical Depression

Total hours observed per class:

H 36

TS 84

TD 12

¹Data pertains only to period tropical cyclone was in the central Pacific

²TD 02C named by the Joint Typhoon Warning Center and all reconnaissance flown under JTWC tasking

³RECCE flown after hurricane reached peak and in weakening trend

TROPICAL DEPRESSION ENRIQUE
July 1 - 5, 1985

Tropical Depression ENRIQUE moved into the CPHC area at 1200 GMT on July 1 after having been a minimal tropical storm near 13N 130W for approximately 24 hours on June 29. ENRIQUE had formed west of the larger and quite intense HURRICANE DOLORES.

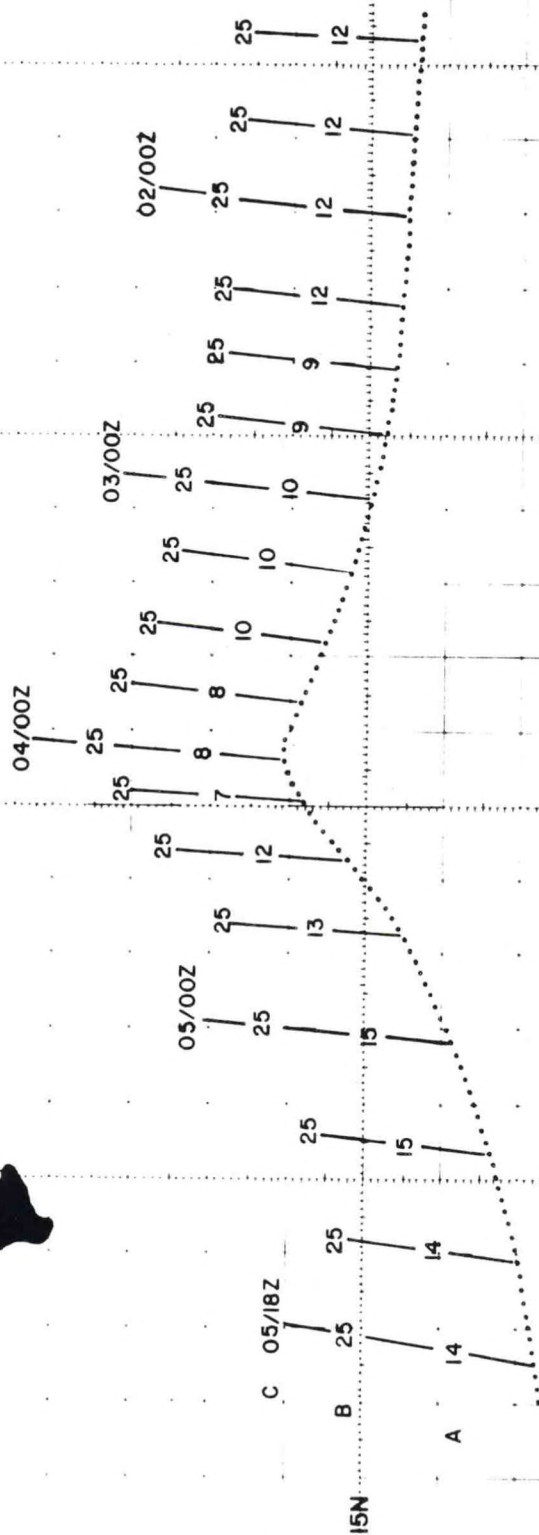
ENRIQUE moved slightly north of west from near 14N 140W on July 1 to 16N 150W on July 4 at an average speed of a little less than 10 knots. Maximum sustained winds were estimated to be about 25 knots with weak southwesterlies to the south of the center. On July 4, ENRIQUE changed course slightly and moved on a south of west track. ENRIQUE was a shallow depression at this time and was carried along by the low level trade wind flow at an increased speed of about 15 knots. ENRIQUE passed about 350 miles south of the Big Island of Hawaii at 1200 GMT on July 5. At this time, it became difficult to find westerly winds on the south side of the depression. Lacking a definite closed circulation, the CPHC issued the last advisory at 2100 GMT on July 5 at a position near 12N 158W.

Moisture carried along by ENRIQUE caused a few localized heavy showers on the windward side of the Big Island of Hawaii on July 5 and over the Kona slopes of the Big Island during the nighttime hours of July 5 and 6.

There were no reports of any ships encountering problems within ENRIQUE's circulation.

HAWAIIAN ISLANDS

160W 20N 155W 150W 145W 140W 20N 15N



TROPICAL DEPRESSION ENRIQUE

1-5 JULY 1985

MAXIMUM WINDS — 25 KT

LEGEND

- A — Speed of Movement
- B — Intensity
- C — Posit at XX/0000Z
- TRACK IS BEST TRACK
- TROPICAL DEPRESSION

HURRICANE IGNACIO

July 21 - 26, 1985

Hurricane IGNACIO developed rapidly from a weak tropical disturbance to near hurricane strength while moving westward along 14N between 130W and 135W on July 21st and 22nd. This is somewhat farther west than usual for this type of rapid cyclogenesis to take place, i.e., over waters with sea surface temperatures of about 27 degrees Celsius. IGNACIO crossed 140W at about 221200 GMT. The Central Pacific Hurricane Center (CPHC) issued its first advisory on Tropical Storm IGNACIO at 221500 GMT with maximum sustained winds estimated at 60 knots. A U.S. Air Force reconnaissance airplane flew into the developing cyclone at daybreak the same morning and estimated the maximum sustained winds to be 75 knots around a well developed eye. IGNACIO was subsequently upgraded to a hurricane.

IGNACIO continued its rapid development while moving on a west northwesterly course at 8 to 12 knots. Later on the 23rd and early on the 24th, maximum sustained winds had reached 115 knots with an estimated central pressure of 960 millibars, thus rivaling some of the more intense hurricanes observed in the central Pacific. The hurricane appeared to have peaked in its intensity during this period. An upper level trough in the westerlies to the northwest of the Hawaiian Islands was slowly moving closer to the approaching IGNACIO. The environment was rapidly becoming less favorable for sustaining IGNACIO as the upper level southwesterlies descended and colder and drier air aloft began to affect the storm.

Satellite imagery received during the night at about 241200 GMT indicated weakening taking place as the eye had become irregular and disappeared. U.S. Air Force Hurricane Hunters flying into the cyclone at 241800 GMT confirmed the weakening trend while locating the center near 16N 147W in an area where other hurricanes (DOT-1959 and FICO-1978) at approximately the same time of the year had maintained their strength. Slight intensification may have occurred later in the day as the eye redeveloped and the hurricane assumed a due westerly course along 16N.

The strong trough in the upper westerlies to the northwest of IGNACIO made recurvature or at least a more northerly track toward the Hawaiian Islands possible. Numerical guidance also showed a tendency for the storm to move on a more northerly track. A Hurricane Watch was issued at 250300Z GMT for the Big Island of Hawaii. The watch was subsequently cancelled at 260300 GMT as IGNACIO started to weaken again near 16N 153W or about 265 NM southeast of Hilo and turned to a west southwesterly course as the effects of the Big Island's topography and the more shallow steering by the trade wind flow made themselves felt.

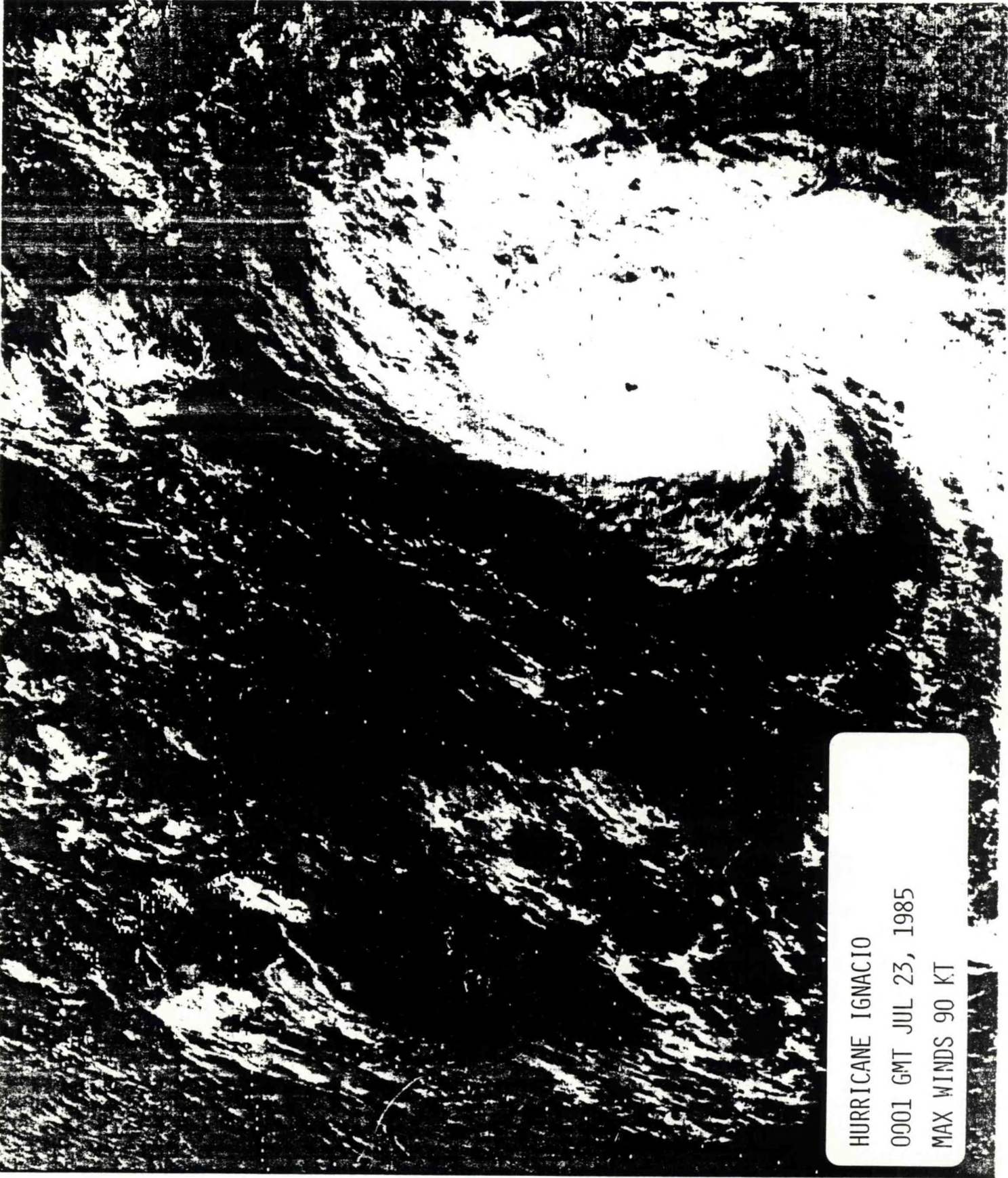
IGNACIO passed to the south of the Big Island at tropical storm strength about 261200 GMT in a rapidly weakening state. There was little effect on the weather over the Hawaiian Islands. However, high surf in the 10 to 15 foot range pounded the southeast facing shoreline of the Puna and Kau coastlines on the Island of Hawaii. The surf peaked on the afternoon of the 25th with some damage to roads and structures near Kalapana and Kapoho reported. The high surf originated from swell generated two days earlier when IGNACIO was near 145W and a young and vigorous hurricane. The NOAA/NWS buoys to the southeast and south of the Hawaiian Islands produced a valuable record of the energy spectrum of the swell generated by this hurricane.

Rainfall from the storm was generally light and only affected the islands of Hawaii and Maui. There were a few reports of amounts greater than 2 inches received on the 26th from stations on the windward slopes of Maui and Hawaii.

IGNACIO was downgraded to a tropical depression and the CPHC issued its last advisory on the system at 270300 GMT when it was classified as a weak tropical disturbance near 14N 160W.

The CPHC issued 19 advisories on IGNACIO. There were no reports of damages or casualties to ships.

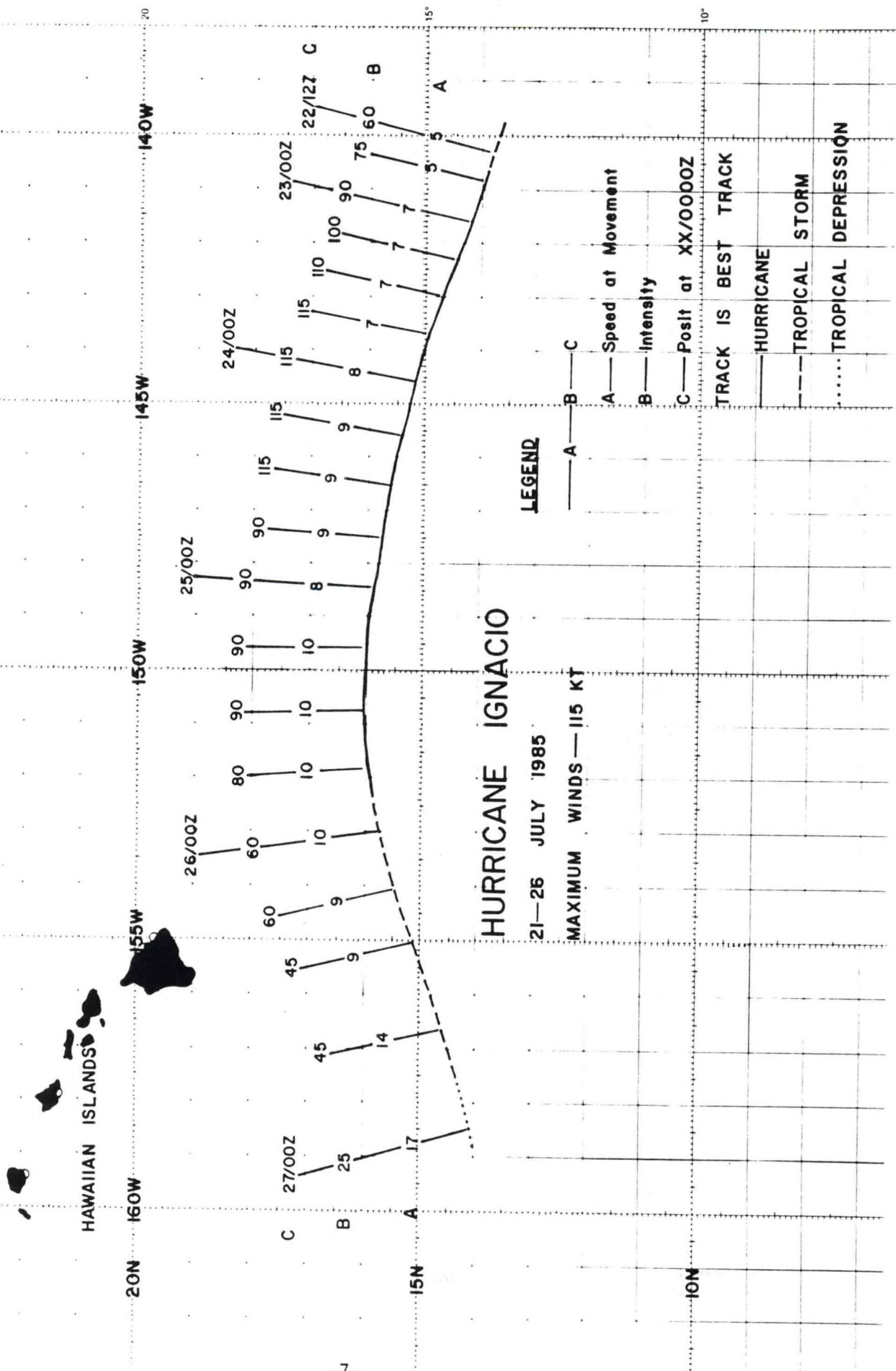
0001 23JL85 38A-1 05124 05072 HA16N146W-1



HURRICANE IGNACIO

0001 GMT JUL 23, 1985

MAX WINDS 90 KT



HURRICANE IGNACIO - July 22 - 26, 1985

DTG GMT	Best Track N/W	Actual Track N/W	Error NM
221200	13.8	13.6	
	140.3	140.5	16
221800	14.0	14.0	
	140.8	140.8	0
230000	14.1	14.1	
	141.6	141.6	0
230600	14.4	14.3	
	142.3	142.3	6
231200	14.7	14.5	
	143.0	143.1	13
231800	14.9	14.7	
	143.7	143.8	13
240000	15.1	15.1	
	144.6	144.6	0
240600	15.4	15.4	
	145.6	145.6	0
241200	15.7	15.7	
	146.5	146.5	0
241800	15.8	15.7	
	147.5	147.6	8
250000	15.9	15.8	
	148.4	148.5	8
250600	16.0	15.9	
	149.6	149.7	8
251200	15.9	15.9	
	150.7	150.7	0
251800	15.8	16.0	
	151.8	151.8	12
260000	15.6	15.7	
	153.0	153.0	6
260600	15.3	15.6	
	154.0	154.0	18
261200	15.0	15.4	
	155.0	155.1	24
261800	14.6	15.2	
	156.6	156.6	36
270000	14.1	14.1	
	158.5	158.5	0

Average Distance Error 9

HURRICANE IGNACIO - July 22 - 26, 1985

DTG	CPHC	24 HOUR FORECAST POSITION						24 HOUR FORECAST ERROR						
		EP HC77 N/W	EP AN85 N/W	EP CL84 N/W	EP HC81 N/W	EP SNBR N/W	NTCM N/W	CP NM	EP 77 NM	EP 85 NM	EP 84 NM	EP 81 NM	EP BR NM	NT CM NM
231200	13.9	14.2	14.0	14.1	14.3	13.5	14.4	89	72	86	101	82	64	116
	144.5	144.3	144.5	144.8	144.5	142.7	145.1							
231800	14.7	14.7	14.7	14.6	14.7		15.3	11	29	17	29	63		88
	144.0	144.3	144.1	144.3	144.9		145.2							
240000	14.8	14.7	15.1	15.1	14.2		15.2	19	27	11	23	71		35
	144.7	144.8	144.8	145.0	143.8		145.2							
240600	14.9	15.1	15.4	15.4			15.3	46	19	29	23			13
	145.0	145.7	145.1	145.2			145.8							
241200	15.0	15.3	15.1	15.0	15.3		15.1	51	24	46	45	27		37
	146.0	146.6	146.0	146.2	146.7		146.7							
241800	15.3	15.6	15.9	15.9			15.9	47	24	36	31			16
	146.9	147.2	147.0	147.1			147.4							
250000	16.0	16.0	16.3	16.1	15.9	16.4	16.3	53	31	50	39	24	78	34
	147.6	148.0	147.8	147.9	148.1	147.3	148.2							
250600	16.4	16.4	16.6	16.4			17.1	65	37	66	59			85
	148.7	149.3	148.8	148.8			148.9							
251200	17.0	16.7	17.0	16.9	16.6	15.6	17.6	67	53	67	61	43	99	106
	150.5	150.3	150.5	150.5	150.5	149.0	150.2							
251800	16.0	16.1	16.1	16.0	15.9		16.7	12	18	8	6	40		45
	151.8	151.5	151.7	151.9	152.5		151.5							
260000	16.0	15.8	15.9	15.8	16.0	15.8	16.6	34	35	21	13	21	81	64
	152.5	152.4	152.7	152.8	152.8	151.6	152.4							
260600	16.0	16.4	16.1	15.9			17.0	24	48	30	19			84
	153.9	153.9	153.9	153.9			153.8							
261200	16.1	16.3	16.1	16.0	16.3	15.3	16.7	45	56	42	37	54	63	78
	154.8	154.8	155.0	154.9	155.0	154.0	154.9							
261800	16.2	16.5	16.3	16.0			17.0	69	85	72	59			108
	156.0	156.0	156.1	156.0			156.4							
270000	15.7	15.6	15.6	15.5	15.5	15.6	16.3	129	104	117	109	93	93	158
	157.0	157.6	157.2	157.3	157.8	158.1	157.0							

AVERAGE DISTANCE ERRORS

50 45 47 44 52 80 72

HURRICANE IGNACIO - July 22 - 26, 1985

DTG	CPHC	48 HOUR FORECAST POSITION						48 HOUR FORECAST ERROR						
		EP HC77 N/W	EP AN85 N/W	EP CL84 N/W	EP HC81 N/W	EP SNBR N/W	NTCM N/W	CP HC NM	EP 77 NM	EP 85 NM	EP 84 NM	EP 81 NM	EP BR NM	NT CM NM
241200	14.3	14.7	14.4	14.7	15.4	13.7	15.7	125	105	139	162	99	163	207
	148.1	148.0	148.5	149.1	148.2	144.6	150.1							
241800	15.3	15.2	15.3	15.3	15.2		16.8	33	32	24	33	37		245
	147.2	147.8	147.5	148.0	148.0		151.7							
250000	15.5	15.3	16.0	16.1	14.4		16.6	49	45	31	19	162		62
	147.7	147.9	148.0	148.6	146.1		149.2							
250600	15.5	15.5	16.8	16.6			16.3	112	37	127	96			29
	147.8	149.2	147.7	148.2			150.0							
251200	15.7	15.6	15.8	15.8	15.7		15.9	98	34	92	86	47		11
	149.0	150.2	149.1	149.2	149.9		150.9							
251800	16.0	15.8	17.2	17.3			17.2	103	70	126	120			74
	150.0	150.6	150.0	150.2			151.5							
260000	17.0	16.3	17.6	17.3	16.6	18.5	17.8	158	99	174	149	148	248	132
	150.6	151.4	150.7	151.0	150.6	149.8	152.3							
260600	17.3	16.7	18.0	17.5			19.4	162	95	191	166			243
	151.8	152.8	151.8	151.9			152.5							
261200	18.0	16.9	17.9	18.1	17.0	16.5	20.0	157	113	156	166	168	217	285
	154.7	153.9	154.3	154.4	152.7	151.5	153.8							
261800	16.1	16.1	16.7	16.3	15.7		18.3	67	102	110	69	102		207
	155.9	155.1	155.5	156.2	154.9		155.0							
270000	16.3	15.7	16.4	16.0	15.5	16.9	18.3	171	159	180	143	162	324	284
	156.6	156.3	156.5	157.0	156.1	153.7	156.2							

AVERAGE DISTANCE ERRORS

113 81 123 110 116 239 162

HURRICANE IGNACIO - July 22 - 26, 1985

DTG	CPHC	72 HOUR FORECAST POSITION						72 HOUR FORECAST ERROR						
		EP HC77 N/W	EP AN85 N/W	EP CL84 N/W	EP HC81 N/W	EP SNBR N/W	NTCM N/W	CP HC NM	EP 77 NM	EP 85 NM	EP 84 NM	EP 81 NM	EP BR NM	NT CM NM
251200	14.8	15.2	14.8	15.3	16.9	14.3	17.5	91	50	77	165	110	277	302
	151.8	151.2	151.4	153.5	152.3	146.2	155.7							
251800	16.0	16.0	16.1	16.0	17.3		17.1	80	80	109	12	79		510
	150.4	150.4	149.9	151.8	151.5		160.6							
260000	16.1	16.4	16.9	17.0	14.6		18.3	129	166	171	83	268		159
	150.8	150.2	150.3	152.5	148.5		153.6							
260600	16.1	15.8	17.9	17.9			17.4	198	127	282	191			125
	150.6	151.8	149.7	151.7			155.1							
261200	16.3	15.5	16.4	17.6	17.3		16.8	186	127	221	217	133		95
	152.0	152.9	151.4	152.1	153.9		155.9							
261800	16.7	16.2	18.3	19.1			18.5	280	199	327	287			199
	152.0	153.3	151.9	153.7			156.2							
270000	17.9	16.6	18.7	19.0	18.8	21.3	19.3	363	290	437	384	339	569	323
	153.6	154.2	152.6	154.2	155.2	152.0	157.0							
AVERAGE DISTANCE ERRORS								190	149	233	190	186	424	245

CENTRAL PACIFIC HURRICANE CENTER
VERIFICATION SUMMARY

HURRICANE IGNACIO
July 22 - 26, 1985

CPHC MEAN ERROR FROM BEST TRACK 9NM

MEAN ERROR (ERROR (NM)/# OF CASES)

	24 HR FCST	48 HR FCST	72 HR FCST
CPHC	50/15	113/11	190/ 7
EPHC77	45/15	81/11	149/ 7
EPAN85	47/15	123/11	233/ 7
EPCL84	44/15	110/11	190/ 7
EPHC81	52/10	116/ 8	186/ 5
EPSNBR	80/ 6	239/ 4	424/ 2
MFM	118/ 5	221/ 3	335/ 2
NTCM	72/15	162/11	245/ 7

TROPICAL STORM LINDA

August 4 - 8, 1985

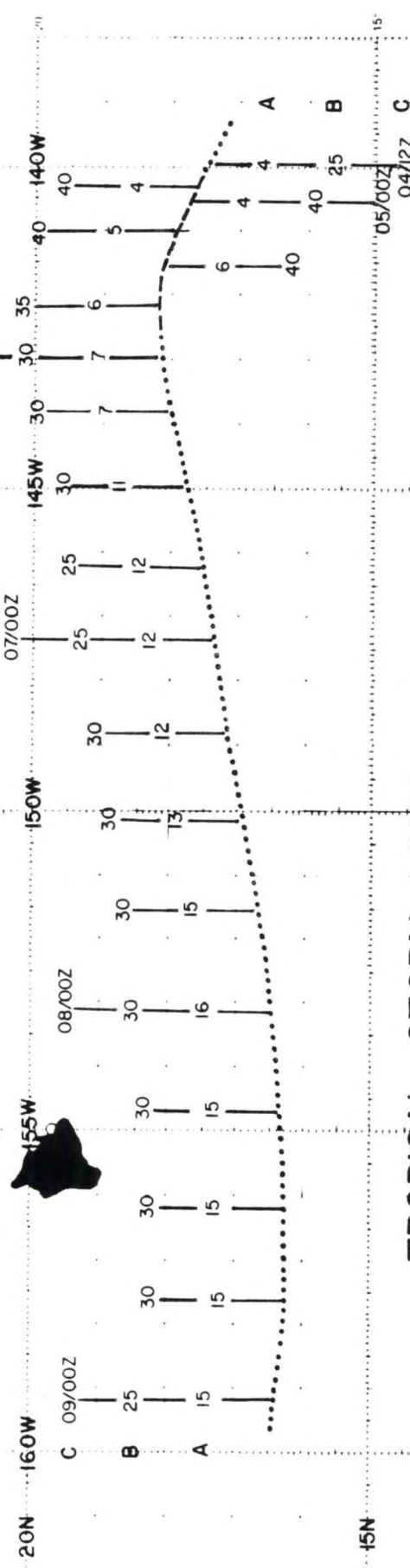
LINDA entered the Central Pacific Hurricane Center's (CPHC) area of responsibility early on August 8 as a tropical depression. Just 48 hours earlier, LINDA had been a tropical storm in the eastern Pacific.

The tropical depression was moving slowly toward the northwest when it crossed over near 17.5N 140W and appeared to be gaining strength again. At 1800 GMT on the 4th, the winds around LINDA were estimated to be 40 knots and LINDA was upgraded to a tropical storm. LINDA remained a tropical storm for about 24 hours and on the 5th started to weaken again and downgraded to a tropical depression near 18N 143W with maximum sustained winds estimated at about 30 knots.

LINDA began to feel the effects of the trade wind flow to its north and began to move on a south of west course. LINDA passed south of the Hawaiian Islands on August 8. Its closest point of approach was 150 miles south of South Point, Hawaii. Some heavy showers associated with LINDA's circulation fell along the windward slopes of the Big Island of Hawaii and Maui with some totals in the 5 to 10 inch range. LINDA continued westward at a moderate speed of 15 knots while weakening further. The CPHC issued its last advisory on LINDA at 090300 GMT when the remains of the system were near 16N 160W.

The CPHC issued 19 advisories on LINDA. There were no reports of damages or casualties to ships.

0
50KT



TROPICAL STORM LINDA

4-8 AUGUST 1985

MAXIMUM WINDS — 40KT

LEGEND

- A — B — C
- A — Speed of Movement
- B — Intensity
- C — Posit at XX/0000Z
- TRACK IS BEST TRACK
- TROPICAL STORM
- TROPICAL DEPRESSION

TROPICAL DEPRESSION 01C

August 20 - 22, 1985

Tropical Depression 01C developed from a disturbance embedded in the trade wind flow south of the Hawaiian Islands. The disturbance passed about 350 miles south of the Big Island of Hawaii on August 19 and had been tracked by the Central Pacific Hurricane Center (CPHC) for several days.

The disturbance appeared to be going through a strengthening phase near 15N 164W and the CPHC issued its first advisory on T.D. 01C at 202100Z. T.D. 01C moved on a west northwesterly course at a rather fast forward speed of 20 knots with maximum sustained winds estimated at 30 knots. The depression passed just south of Johnston Island at 211500Z with sustained winds of 25 knots reported on the tiny atoll.

A large trough in the upper level westerlies had been developing to the north and west of the depression. The close proximity of the upper level trough and its associated southwesterlies working their way into the lower troposphere limited further development of T.D. 01C.

The CPHC issued its last advisory on T.D. 01C at 230300 GMT when the system appeared in satellite imagery as being rather ragged and ill defined and the low level circulation center difficult to find.

○
PMDY

TROPICAL DEPRESSION OIC

20-21 AUGUST 1985

MAXIMUM WINDS - 30 KT

○
FFS

○
51001

C 22/00Z

20N

21/00Z

20N

B 25

30

30

30

30

A 21

18

18

15

15

30

15

○
PDOM

15N

15N

LEGEND

— A — B — C

A — Speed of Movement

B — Intensity

C — Posit at XX/0000Z

TRACK IS BEST TRACK

..... TROPICAL DEPRESSION

10N

175W

170W

165W

10N

TROPICAL DEPRESSION 02C/TYPHOON SKIP

August 30 - September 7, 1985

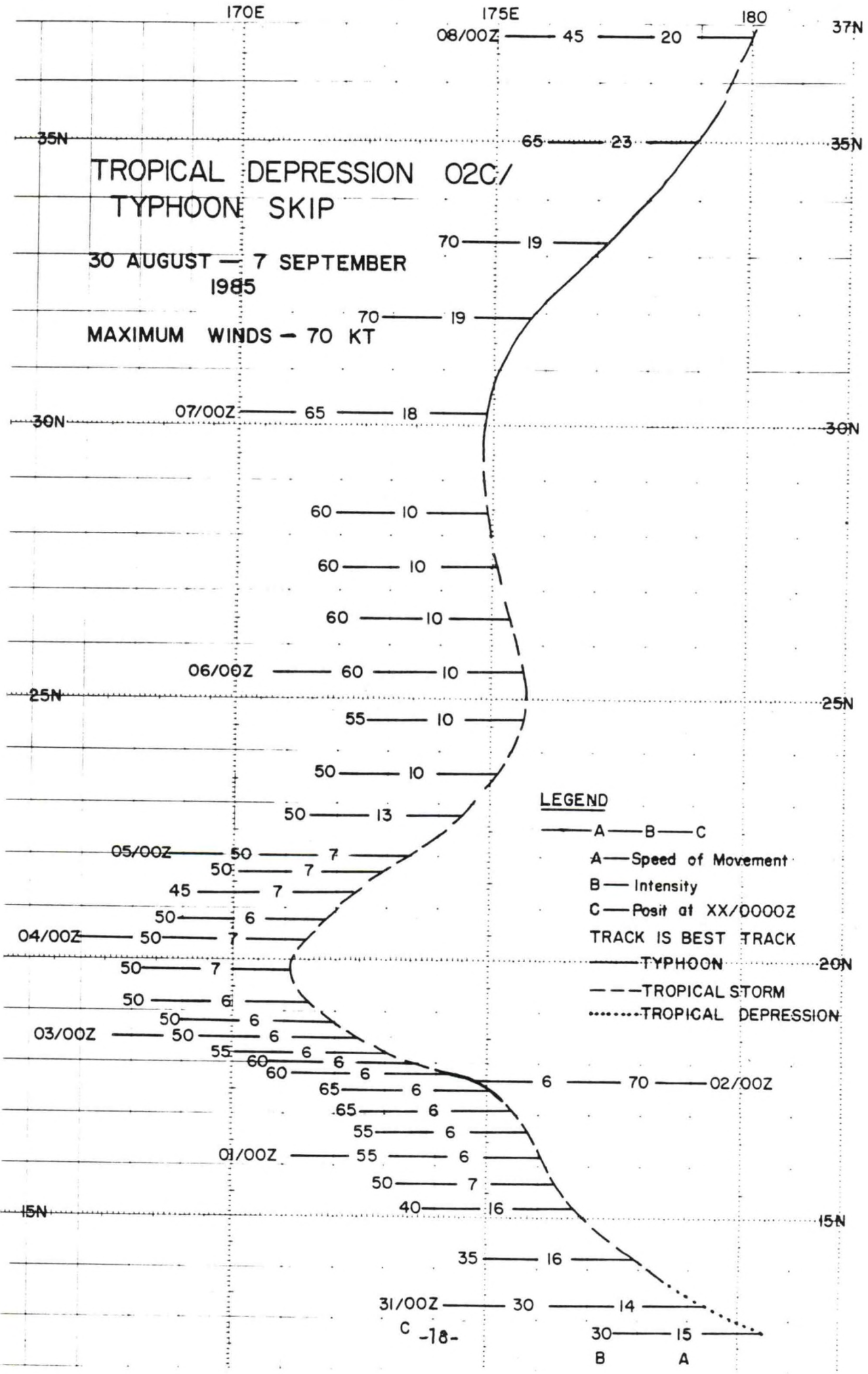
Tropical Depression 02C developed from a disturbance which passed well south of the Hawaiian Islands late in August. The Central Pacific Hurricane Center (CPHC) tracked the disturbance for several days and determined the system had developed into a tropical depression on August 30 and was in a favorable environment for continued development. The CPHC issued the first advisory on T.D. 02C at 302000 GMT when the system was centered near 13N 179W.

The Joint Typhoon Warning Center (JTWC) on Guam took over responsibility for the issuance of subsequent bulletins on T.D. 02C with the 310300 GMT advisory. T.D. 02C continued to strengthen west of the International Dateline and at 310900 GMT was christened Tropical Storm SKIP by the JTWC.

SKIP moved in a northwesterly direction after crossing the dateline and for a time became a threat to Wake Island. However, the Tropical Upper Tropospheric Trough (TUTT) to the north and west of SKIP began to steer the system northward and eventually caused it to recurve toward the northeast. During this period, SKIP went through two strengthening phases and reached typhoon intensities on two occasions, once for about an 18-hour period on September 1 and again for about a 24-hour period on the 7th (see best track chart).

SKIP crossed the International Dateline moving toward the northeast on September 8 as a weakening tropical storm, rapidly taking on extratropical characteristics. The CPHC assumed responsibility for advisories at this time and issued the final advisory on SKIP at 080300 GMT. The system was subsequently carried as a gale low in the high seas marine bulletin issued by the Weather Service Forecast Office in Honolulu.

A total of 34 advisories were issued on T.D. 02C/Typhoon SKIP; the initial and final advisory by the CPHC and the remainder by the JTWC. There were no reports of damages or casualties to ships.



B A

HURRICANE PAULINE

September 5 - 9, 1985

Hurricane PAULINE entered the Central Pacific Hurricane Center's area of responsibility on September 5, crossing over from the eastern Pacific near 18N 140W. PAULINE had become a hurricane 24-hours earlier near 18N 134W and was in the prime of her life with maximum sustained winds estimated at 75 knots. PAULINE remained a steady state hurricane at this intensity for the next two days as it moved westward and later northwestward at a forward speed of 10 knots in the general direction of the Hawaiian Islands.

A Hurricane Watch was issued for the Big Island of Hawaii at 062100 GMT when PAULINE was located near 19N 146W or about 550 miles east of Hilo as it appeared the storm could affect the weekend weather over the Hawaiian Islands. PAULINE subsequently turned on a more northwesterly and later northerly course heading north along the 146 degree meridian while weakening. As a result of PAULINE's change in direction of movement, the Hurricane Watch was cancelled at 071500 GMT.

Swell emanating from PAULINE's circulation did cause high surf conditions along the east facing shores of all the Hawaiian Islands. Surf heights of 10 to 15 feet were reported along the Puna and Kau coastlines of the Big Island of Hawaii and caused the temporary closure of several roads due to debris being tossed up on the thoroughfares by breaking waves. No damage to roads or property was reported.

An upper tropospheric trough moving southeast toward PAULINE caused her to veer to the north. Once PAULINE turned to a more northerly course, she began to feel the effects of shearing stresses of the upper level southwesterlies and began to weaken. The upper level flow predominated and the rapidly weakening low level circulation was carried northward over the next several days. PAULINE was downgraded to a tropical storm near 23N 146W at 081500 GMT and a tropical depression near 26N 146W at 090900Z.

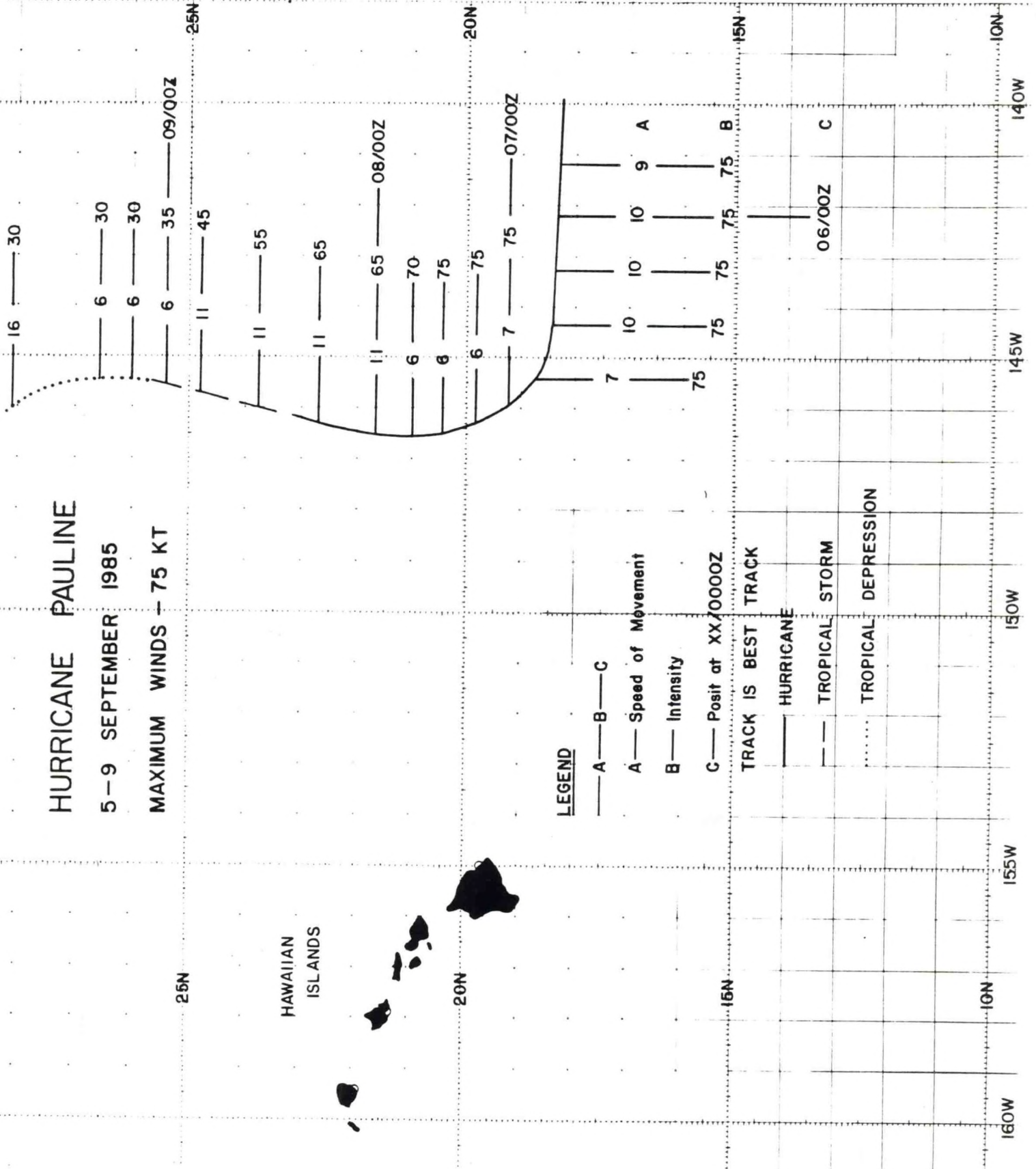
The last advisory (number 53...denoting a life cycle of 13 days) was issued by the CPHC at 092100Z. The remnants of PAULINE moved northwestward very slowly into an area of low pressure near 30N 150W, south of a large blocking high centered in the Gulf of Alaska. A recognizable circulation in the low levels was discernible in satellite imagery for several days as it drifted westward far to the north of the Hawaiian Islands.

The CPHC issued 17 advisories on PAULINE while the system was in its area of responsibility. There were no reports of casualties or damage to ships.

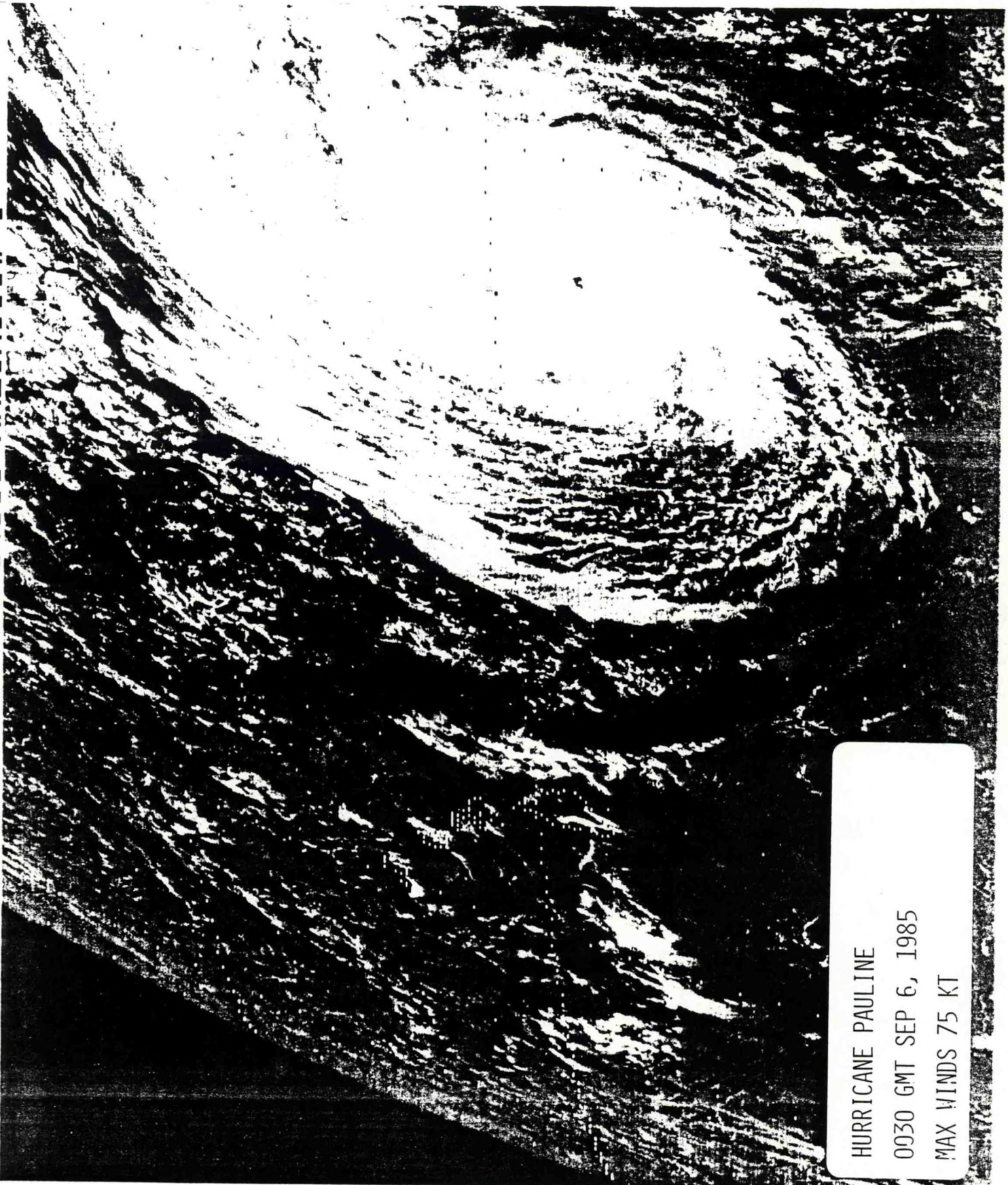
HURRICANE PAULINE

5-9 SEPTEMBER 1985

MAXIMUM WINDS - 75 KT



0030 06SE85 38A-1 04591 04511 HA20M150W-1



HURRICANE PAULINE

0030 GMT SEP 6, 1985

MAX WINDS 75 KT

HURRICANE PAULINE - September 5 - 9, 1985

DTG GMT	Best Track N/W	Actual Track N/W	Error NM
051800	18.4	18.4	
	141.2	141.2	0
060000	18.3	18.6	
	142.2	142.0	22
060600	18.4	18.6	
	143.3	143.1	17
061200	18.5	18.6	
	144.4	144.6	14
061800	18.7	18.6	
	145.4	145.5	8
070000	19.2	19.2	
	146.0	145.9	7
070600	19.8	19.8	
	146.3	146.2	7
071200	20.4	20.4	
	146.5	146.5	0
071800	21.0	20.7	
	146.6	146.4	21
080000	21.7	21.6	
	146.5	146.2	18
080600	22.7	22.9	
	146.3	146.0	21
081200	23.8	23.1	
	146.0	146.1	42
081800	24.8	24.8	
	145.7	145.5	12
090000	25.4	25.4	
	145.6	145.9	17
090600	26.0	25.7	
	145.4	145.6	21
091200	26.6	26.5	
	145.5	145.5	7
091800	28.1	28.1	
	146.0	146.0	0

Average Distance Error 14

HURRICANE PAULINE - September 5 - 9, 1985

DTG	CPHC	24 HOUR FORECAST POSITION						NTCM	24 HOUR FORECAST ERROR						
		EP HC77	EP AN85	EP CL84	EP HC81	EP SNBR	CP HC		EP 77	EP 85	EP 84	EP 81	EP BR	NT CM	
GMT	N/W	N/W	N/W	N/W	N/W	N/W	N/W	NM	NM	NM	NM	NM	NM	NM	
061800	18.4						18.8	97							103
	147.2						147.3								
070000	18.6	18.5	18.8	18.5	18.4			50	51	30	45	70			
	146.5	146.4	146.2	146.2	146.8										
070600	18.6	18.8	18.8	18.5			19.3	73	91	87	100				79
	146.4	147.4	147.3	147.3			147.5								
071200	18.5	18.5	18.9	18.6	18.8	18.3	19.4	204	195	212	221	180	131	180	
	149.5	149.3	149.9	149.9	149.2	147.1	149.5								
071800	18.5	18.7	18.9	18.6			19.8	257	217	250	264				193
	150.3	149.6	150.4	150.5			149.7								
080000	19.6	20.0	19.7	19.5	19.7		20.5	250	214	242	253	222			196
	150.1	149.6	150.0	150.1	149.6		149.5								
080600	19.8	21.1	20.5	20.3			20.9	212	163	212	213				192
	147.8	148.2	148.8	148.6			148.7								
081200	22.7	22.6	22.3	22.5	22.7	23.6	22.3	135	115	111	76	102	63	111	
	148.5	148.1	147.9	147.3	147.9	145.1	147.9								
081800	22.4	22.6	21.5	21.5			22.1	178	165	203	198				163
	147.4	147.3	146.3	145.6			145.8								
090000	23.1	24.0	24.1	24.8	24.5		25.0	202	100	78	84	73			64
	148.6	146.9	145.8	144.5	146.8		144.8								
090600	25.2	26.5		28.0			27.4	273	72		146				121
	150.6	146.6		146.5			146.8								
091200	25.2	26.1		27.1	25.8		27.0	286	95		69	172			86
	150.6	147.2		146.6	148.6		147.0								
091800	28.0	28.2		28.3			28.8	96	22		25				42
	147.8	146.4		145.6			146.1								

AVERAGE DISTANCE ERRORS

178 125 158 141 137 97 128

HURRICANE PAULINE - September 5 - 9, 1985

DTG	CPHC	48 HOUR FORECAST POSITION						48 HOUR FORECAST ERROR							
		EP HC77 N/W	EP AN85 N/W	EP CL84 N/W	EP HC81 N/W	EP SNBR N/W	NTCM N/W	CP HC NM	EP 77 NM	EP 85 NM	EP 84 NM	EP 81 NM	EP BR NM	NT CM NM	
071800	18.4 153.2						19.7 153.3	408							393
080000	18.5 151.7	19.0 150.1	19.3 150.4	18.1 150.0	19.5 149.5			361	269	273	300	224			
080600	18.5 151.8	19.3 151.0	19.4 151.4	18.2 151.2			20.7 152.2	419	354	368	406				370
081200	18.4 154.4	18.9 153.2	19.3 154.5	18.2 154.4	19.7 151.1	18.5 148.7	21.0 154.3	544	471	522	551	346	312	473	
081800	18.4 155.0	19.4 153.2	19.4 155.1	18.3 155.1			22.1 153.0	654	537	624	662				443
090000	20.9 154.2	21.2 152.9	20.5 152.9	19.6 154.1	19.9 151.1		22.9 152.4	531	461	486	572	438			386
090600	20.0 148.8	22.0 149.7	21.6 151.2	20.8 150.9			22.3 151.2	385	316	394	414				368
091200	23.5 150.5	24.2 148.8	23.6 149.9	24.6 148.0	25.2 147.0	23.6 145.1	24.0 149.5	326	226	296	177	112	175	264	
091800	23.5 151.5	23.4 148.4	23.2 146.8	22.3 146.0			24.9 144.6	405	310	297	348				206

AVERAGE DISTANCE ERRORS

448 368 408 429 280 244 363

HURRICANE PAULINE - September 5 - 9, 1985

DTG	CPHC	72 HOUR FORECAST POSITION						NTCM	72 HOUR FORECAST ERROR							
		EP HC77 N/W	EP AN85 N/W	EP CL84 N/W	EP HC81 N/W	EP SNBR N/W	EP N/W		CP HC NM	EP 77 NM	EP 85 NM	EP 84 NM	EP 81 NM	EP BR NM	NT CM NM	
081800	18.8 159.1						21.0 159.2	838								790
090000	18.4 156.6	20.1 153.8	19.5 154.0	18.2 152.8	21.0 151.5			728	540	572	578	406				
090600	18.5 155.8	20.0 155.2	19.5 154.9	18.3 153.9			22.7 157.1	712	631	635	640					654
091200	18.4 159.5	19.4 157.2	20.3 157.9	18.2 157.7	22.5 152.9		23.5 159.0	915	774	777	840	470				755
091800	18.4 160.0	20.7 156.7	20.3 158.4	18.3 158.5			25.6 155.5	965	733	823	905					530
AVERAGE DISTANCE ERRORS								832	670	702	741	438	N/A	682		

CENTRAL PACIFIC HURRICANE CENTER
VERIFICATION SUMMARY

HURRICANE PAULINE
September 5 - 9, 1985

CPHC MEAN ERROR FROM BEST TRACK 14NM

MEAN ERROR (ERROR (NM)/# OF CASES)

	24 HR FCST	48 HR FCST	72 HR FCST
CPHC	178/13	448/ 9	832/ 5
EPHC77	125/12	368/ 8	670/ 4
EPAN85	158/ 9	408/ 8	702/ 4
EPCL84	141/12	429/ 8	741/ 4
EPHC81	137/ 6	280/ 4	438/ 2
EPSNBR	97/ 2	244/ 2	N/A
MFM	68/ 2	130/ 1	86/ 1
NTCM	128/12	363/ 8	682/ 4

0030 09SE85 38A-1 04595 04503 HA20N150W-1



HURRICANE RICK & T.D. PAULINE

0030 GMT SEP. 9, 1985

MAX WINDS 125 KT

HURRICANE RICK

September 9 - 11, 1985

Hurricane RICK was a very powerful tropical cyclone when it crossed 140W and into the Central Pacific Hurricane Center's (CPHC) area of responsibility at 091200 GMT. RICK was well developed, circular, and symmetrical with a relatively large (40 mile diameter) well defined eye. Maximum sustained winds were estimated at 125 knots and made RICK one of the most intense hurricanes of record in the central Pacific exceeding by 5 knots the 120 knot maximum intensities of SUSAN in 1978, CELESTE in 1972 and the 115 knot winds of FICO in 1978 in the same area of the Pacific just east of 140W. Only Hurricane PATSY in the pre-satellite era of 1959 may have exceeded RICK in intensity.

RICK was at his peak intensity as he crossed 140W moving in a northwesterly direction at 10 knots along a path following Hurricane PAULINE which preceded RICK through the area several days earlier. Satellite imagery suggested a weakening trend commencing on the 10th as the eye became ragged and filled with low cloudiness. Air Force reconnaissance began to fly into RICK at this time and made the first fix on the system at 100600 GMT. The weather officer on board the aircraft estimated the winds at 100 knots. A dropsonde released in the eye of RICK showed an extrapolated central pressure at the surface of 951 millibars.

The same forces which caused the shearing, weakening, and a trend toward recurvature on PAULINE several days earlier began to affect RICK. RICK, thusly, declined rapidly in intensity in the same general area 600 miles east of Hilo and at 111200 GMT was downgraded to a tropical storm. Twelve hours later, RICK was downgraded to a tropical depression. The remnant low level circulation was carried northward toward the same area of low pressure which PAULINE moved into several days earlier. Satellite cloud imagery continued to show the existence of a weak low level circulation for several days.

RICK's intensity was much greater than PAULINE's and would've created much larger surf along the east facing shores of the Hawaiian Islands, but because he turned toward the north sooner than PAULINE, the significantly larger swell emanating from RICK passed well to the east of the state. The surf did rise somewhat, but nowhere near the heights experienced with the passing of PAULINE.

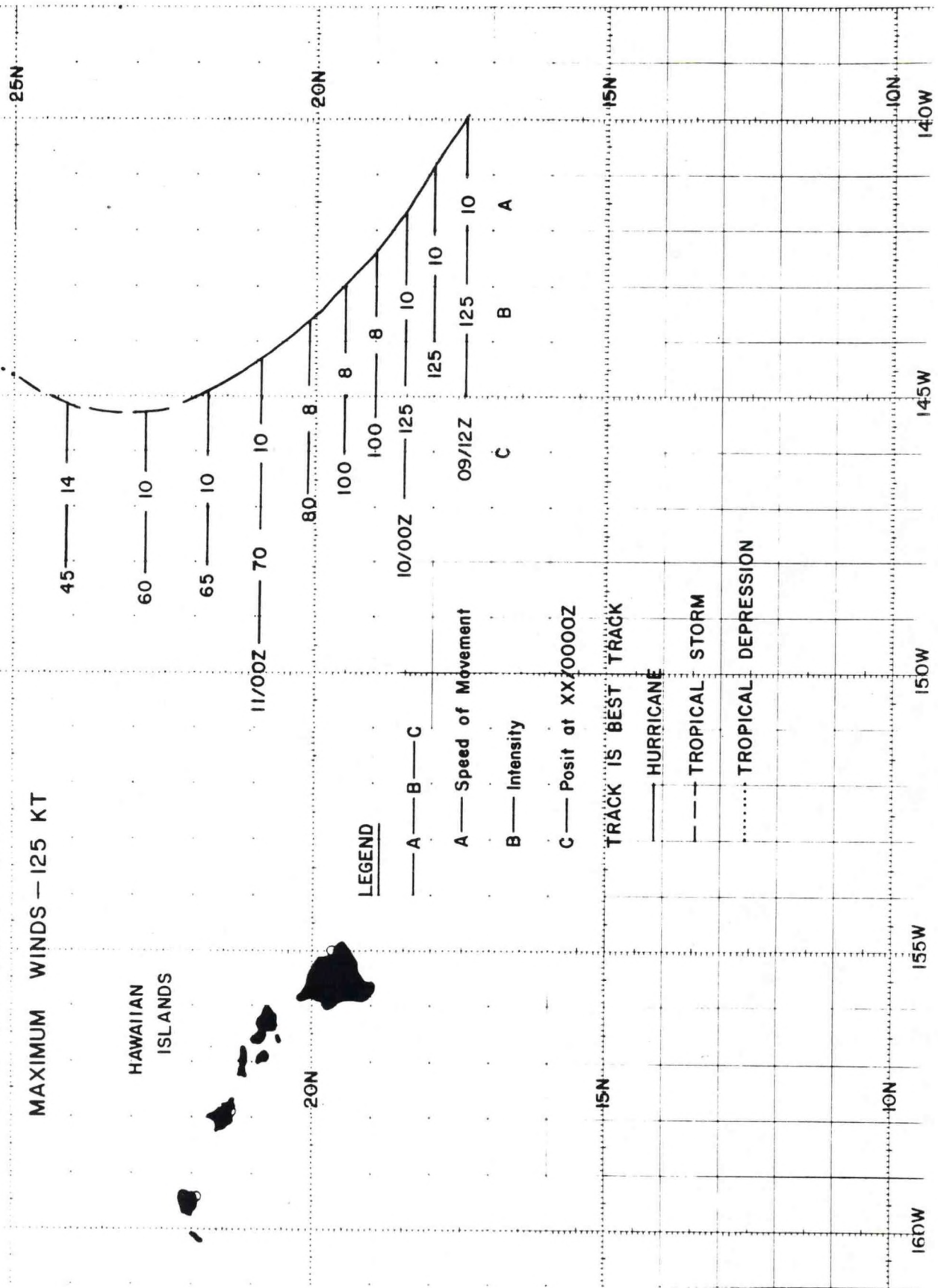
The CPHC issued 12 advisories on RICK. The final advisory was issued at 120300 GMT.

There were no reports of casualties or damages to ships. However, the U. S. Coast Guard received a report on a sailing vessel which was enroute to the Hawaiian Islands via the Panama Canal as being overdue. The course of the vessel is not known, therefore, there is no way of telling whether PAULINE or RICK had a direct bearing on the vessel being overdue.

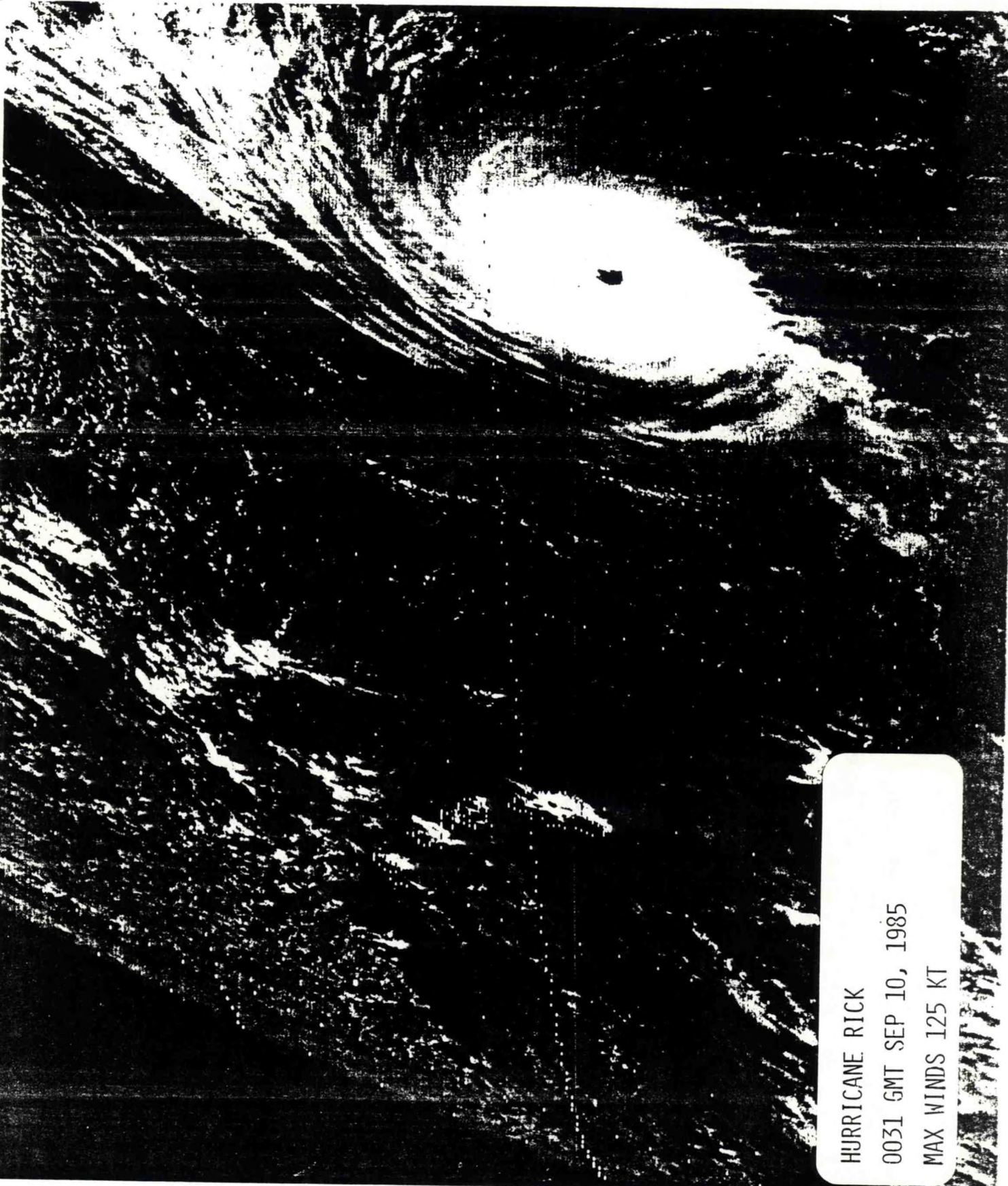
HURRICANE RICK

9-11 SEPTEMBER 1985

MAXIMUM WINDS - 125 KT



0031 10SE85 38A-1 04582 04504 HA20N150W-1



HURRICANE RICK
0031 GMT SEP 10, 1985
MAX WINDS 125 KT

HURRICANE RICK - September 9 - 11, 1985

DTG GMT	Best Track N/W	Actual Track N/W	Error NM
091200	17.5 140.0	17.5 140.0	0
091800	18.0 140.9	18.1 141.1	14
100000	18.5 141.8	18.5 141.9	7
100600	19.0 142.4	18.9 142.5	8
101200	19.5 143.0	19.6 143.2	13
101800	20.1 143.7	20.4 143.7	18
110000	20.9 144.3	21.2 144.0	25
110600	21.8 145.0	21.8 144.7	17
111200	22.8 145.3	22.8 145.3	0
111800	24.1 145.1	24.1 145.0	7
120000	25.5 144.3	25.5 144.4	7
Average Distance Error			11

HURRICANE RICK - September 9 - 11, 1985

DTG	CPHC	24 HOUR FORECAST POSITION							24 HOUR FORECAST ERROR						
		EP HC77	EP AN85	EP CL84	EP HC81	MFM	NTCM	CP HC	EP 77	EP 85	EP 84	EP 81	MFM	NTCM	
GMT	N/W	N/W	N/W	N/W	N/W	N/W	N/W	NM	NM	NM	NM	NM	NM	NM	
101200	19.5 142.8	18.5 142.7	19.3 143.3	19.2 143.0	18.0 143.4		19.8 142.4	24	72	19	27	97		47	
101800	19.2 145.1						20.3 143.8	107						8	
110000	20.3 145.9	19.9 145.6	20.4 145.4	20.3 145.4	19.1 145.5	22/5 143.1	21.0 144.3	119	119	92	95	152	93	21	
110600	20.7 146.0							98							
111200	22.5 146.0	20.6 144.4	21.0 144.5	21.1 144.4	21.4 145.0	24.3 143.0	23.0 144.8	43	141	117	114	86	155	30	
111800	24.1 145.4							22							
120000	25.1 145.3		24.5 145.8	24.9 144.5		30.2 144.7	24.6 145.2	55		97	37		282	69	
AVERAGE DISTANCE ERRORS								67	111	81	68	112	177	35	

HURRICANE RICK - September 9 - 11, 1985

DTG	CPHC	48 HOUR FORECAST POSITION							48 HOUR FORECAST ERROR						
		EP HC77	EP AN85	EP CL84	EP HC81	MFM	NTCM	CP HC	EP 77	EP 85	EP 84	EP 81	MFM	NTCM	
GMT	N/W	N/W	N/W	N/W	N/W	N/W	N/W	NM	NM	NM	NM	NM	NM	NM	
111200	20.3	19.1	20.1	20.9	18.7		22.0	164	223	180	129	250		69	
	146.5	145.0	146.7	146.4	146.1		144.4								
111800	22.0						22.8	208						81	
	148.0						145.4								
120000	23.2	20.9	22.2	22.2	21.0	28.0	23.9	277	364	280	321	286	201	108	
AVERAGE DISTANCE ERRORS								216	294	230	225	268	201	86	

CENTRAL PACIFIC HURRICANE CENTER
VERIFICATION SUMMARY

HURRICANE RICK
September 9 - 11, 1985

CPHC MEAN ERROR FROM BEST TRACK 11NM

MEAN ERROR (ERROR (NM))/# OF CASES)

	24 HR FCST	48 HR FCST	72 HR FCST
CPHC	67/ 7	216/ 3	N/A
EPHC77	111/ 3	294/ 2	N/A
EPAN85	81/ 4	280/ 2	N/A
EPCL84	68/ 4	225/ 2	N/A
EPHC81	112/ 3	268/ 2	N/A
MFM	177/ 3	201/ 1	N/A
NTCM	35/ 5	86/ 3	N/A

HURRICANE NELE
October 23-30, 1985

The Central Pacific Hurricane Center (CPHC) began to track a disturbance in the intertropical convergence zone near 10N 145W on October 20. The disturbance moved westward along 10N and passed to the south of Hawaii on the 22nd showing signs of intensification. The CPHC issued its first advisory on Tropical Depression 03C at 1800 GMT on October 23. Poor satellite imagery made the system difficult to fix and classify using the Dvorak technique as 03C was near the western edge of GOES West pictures. Forecasters at the CPHC felt 03C was intensifying rapidly and 6 hours later at 240000 GMT upgraded 03C to a tropical storm and named it NELE.

NELE continued to intensify while moving on a more northwesterly course. NELE reached hurricane strength near 14N 164W at 251200 GMT as she turned to a more northerly course and followed the 164 degree meridian at a slow forward speed of 5 knots. NELE's behavior during this period was very similar to two other late season hurricanes: NINA in November 1957 and IWA in November 1982. Both of these hurricanes caused considerable damage to the Hawaiian Islands even though NINA turned westward before actually striking the islands. NELE reached her peak intensity of 80 knots at about 260000 GMT. During the next 18 hours, large swell emanating from NELE began to reach the southern shores of Kauai where in the forenoon on the 26th, surf of 10 feet began to wash over the low beach roads in the Poipu area.

The steering flow over NELE was very weak as she drifted northward, and a trough in the upper level westerlies to the northwest of NELE caused great concern to the forecasters at the CPHC. The upper level pattern was becoming very similar to that associated with IWA's recurvature to the northeast in 1982. A hurricane watch was issued for the Hawaiian Islands early on the 26th. The next 24 hours was one of watch-and-see as NELE continued to move slowly northward. NELE showed signs of turning to the northwest on the morning of the 27th but this movement was uncertain as she was in an area of extremely poor satellite surveillance. Air Force reconnaissance aircraft flew into NELE at approximately 271500 GMT and confirmed that she had indeed begun to change course toward the northwest. The hurricane watch for the Hawaiian Islands was subsequently cancelled at 271845 GMT.

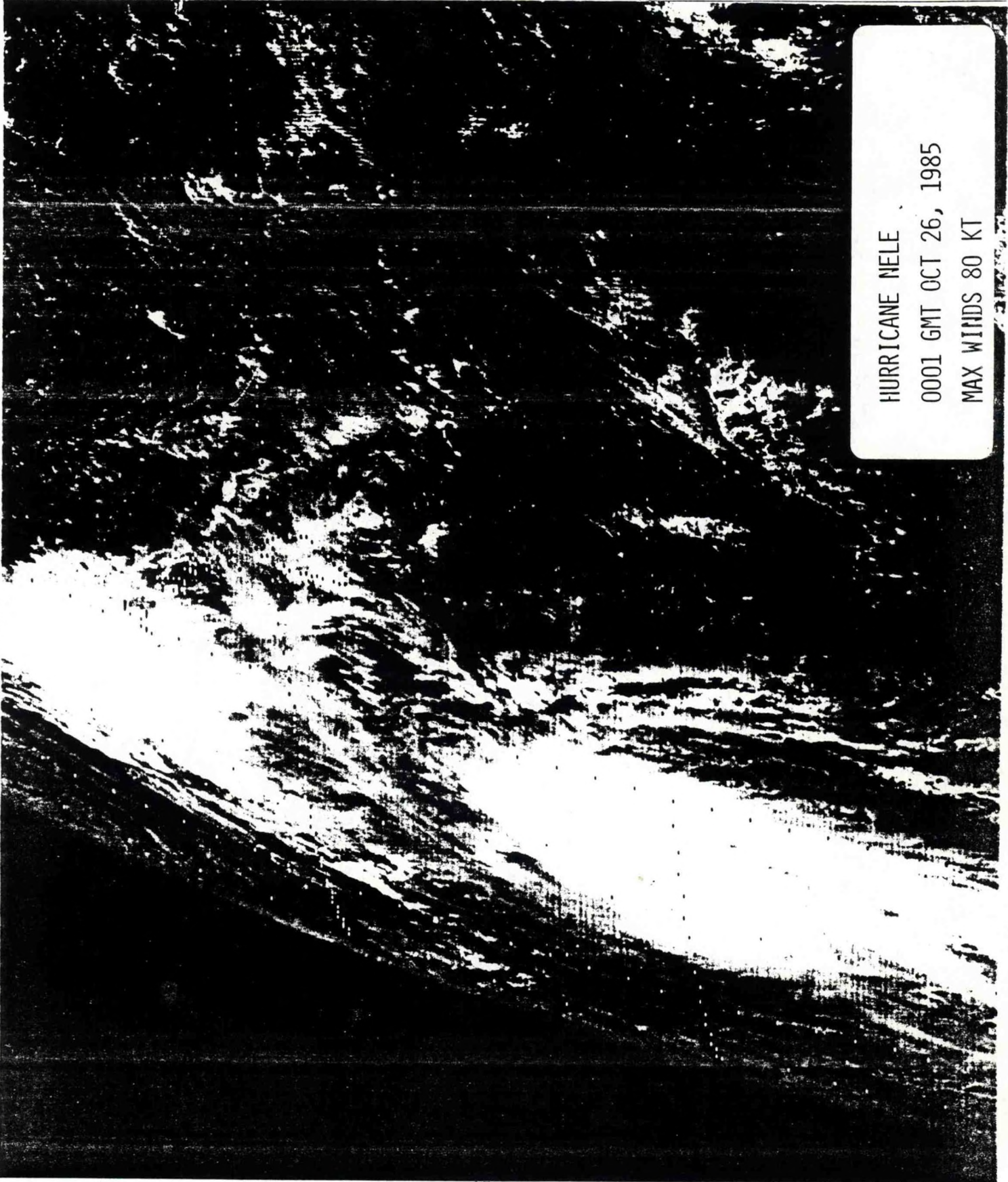
NELE now assumed a course of about 330 degrees with a forward speed of 10 knots. She had become a steady state hurricane with maximum sustained winds of 70 knots and moved across the leeward islands of the Hawaiian chain passing about 100 miles west of French Frigate Shoals. Closest approach to Tern Island, where the National Weather Service maintains an automatic weather station, occurred at about 281600 GMT. The surface pressure recorded at this time was 1000MB and maximum sustained winds were reported from the southeast at 31 knots with gusts to 43 knots. The central pressure of NELE at this time was estimated by Air Force reconnaissance aircraft using a dropsonde as 985MB and the maximum surface winds estimated at 75 knots.

Several fishing boats spent a rough night hove to at French Frigate Shoals as huge southeasterly swell and waves churned the shallow waters of the reef surrounding the island. One fishing vessel farther west near the Gardner Pinnacles and more directly in the path of NELE was partially disabled and needed Coast Guard assistance. Other fishing vessels near Maro Reef and Laysan Island had an easier time as they were on the weaker, left hand semicircle of the hurricane.

NELE assumed a northerly heading near 26N 170W and followed the 170 degree meridian with her intensity fluctuating near the minimum hurricane intensity of 65 knots. One vessel located in the dangerous right-hand semicircle reported winds of 70 knots with seas of 30 to 40 feet at 291800Z some distance to the east of the center. NELE was at this time starting to accelerate northward at a forward speed of about 20 knots. Recurvature toward the northeast started near 32N 170W at 300600 GMT and NELE finally began to weaken. NELE was at this time classified as an extratropical storm and the final advisory was issued. The remains of NELE moved into the shipping lanes near 40N 160W on October 31.

The CPHC issued 30 advisories on NELE. There were no reports of serious damages or casualties to ships. The fishing vessel that was partially disabled due to a broken rudder was the Alaska Ohana. The tug Moana Holo en route from Johnston Island to Honolulu provided the CPHC with several reports near 19N 165W as she rode out the dangerous north semicircle of NELE.

0001 260C85 38A-1 05038 03511 HA17N155W-1



HURRICANE NELE

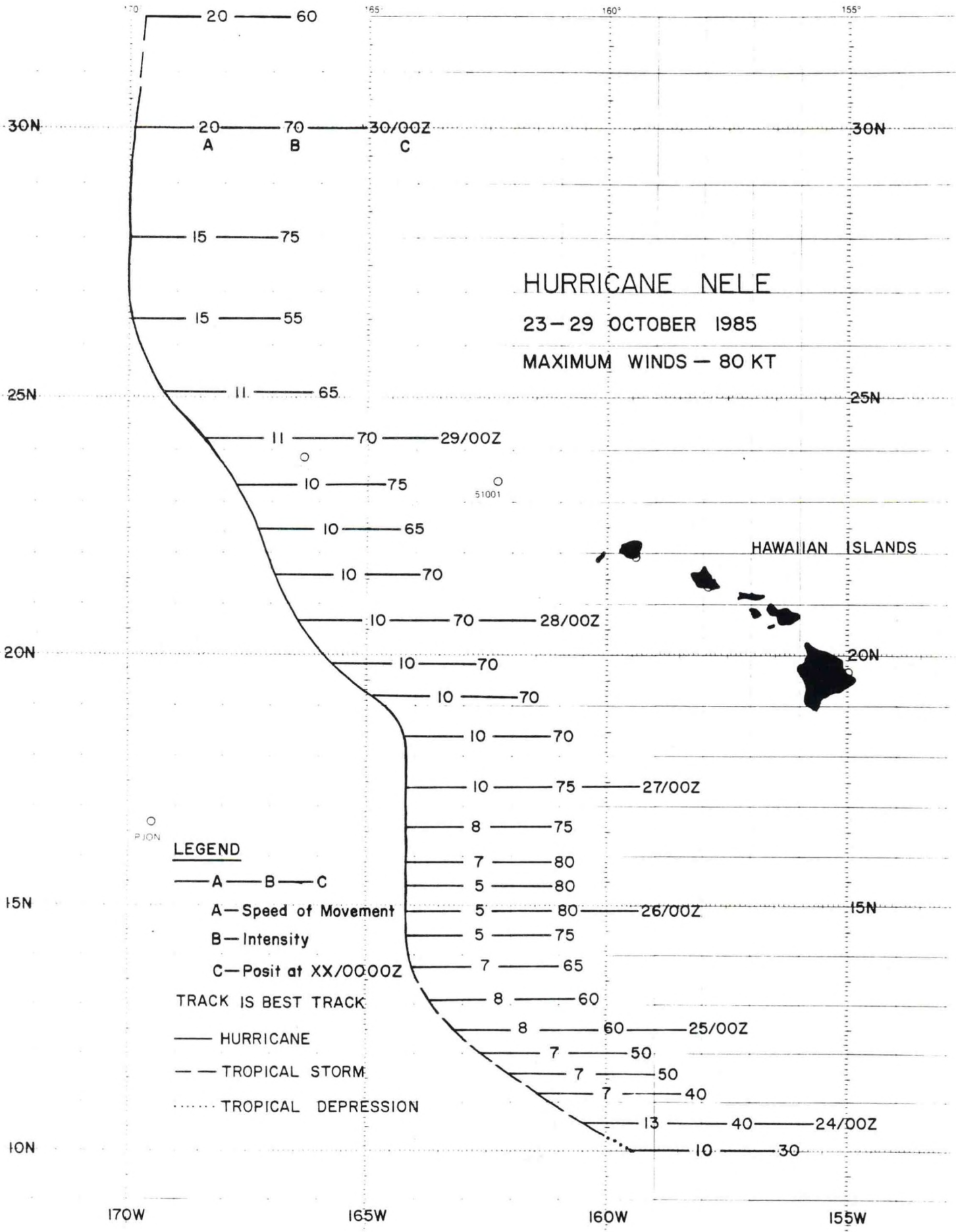
0001 GMT OCT 26, 1985

MAX WINDS 80 KT

0000 280C85 38A-1 05031 03612 HA17N155W-1



HURRICANE NELE
0000 GMT OCT 28, 1985
MAX WINDS 70 KT



HURRICANE NELE - October 23 29, 1985

DTG	Best Track	Actual Track	Error
GMT	N/W	N/W	NM
231800	10.0	10.0	
	159.5	159.5	0
240000	10.6	10.2	
	160.5	160.2	30
240600	11.2	11.7	
	161.5	161.5	30
241200	11.6	12.0	
	162.1	163.0	58
241800	12.0	12.1	
	162.6	163.4	47
250000	12.5	12.5	
	163.2	163.0	12
250600	13.1	12.8	
	163.7	163.4	25
251200	13.8	13.8	
	164.1	164.6	29
251800	14.4	14.5	
	164.2	164.2	7
260000	14.9	14.3	
	164.2	164.2	36
260600	15.4	15.3	
	164.2	164.2	7
261200	15.9	15.9	
	164.2	164.1	7
261800	16.6	16.7	
	164.2	163.6	35
270000	17.4	17.4	
	164.2	164.2	0
270600	18.4	18.0	
	164.3	164.2	25
271200	19.2	18.6	
	164.9	164.2	54
271800	19.8	19.8	
	165.7	165.9	12
280000	20.7	20.7	
	166.4	166.3	7
280600	21.6	21.6	
	166.9	166.9	0
281200	22.5	22.4	
	167.3	167.3	7
281800	23.3	23.3	
	167.7	167.7	0
290000	24.2	24.3	
	168.4	168.2	13
290600	26.1	25.1	
	169.2	169.1	60
291200	26.5	26.5	
	169.9	170.0	7
291800	28.0	28.0	
	170.0	169.7	16
300000	30.0	30.0	
	169.9	169.7	11
300600	32.0	31.8	
	169.7	168.8	14

Average Distance Error 20

HURRICANE NELE - October 23 - 29, 1985

DTG	CPHC	24 HOUR FORECAST POSITION						24 HOUR FORECAST ERROR							
		EP	EP	EP	EP	MFM	NTCM	CP	EP	EP	EP	EP	MFM	NTCM	
		HC77	AN85	CL84	HC81			HC	77	85	84	81			
GMT	N/W	N/W	N/W	N/W	N/W	N/W	N/W	NM	NM	NM	NM	NM	NM	NM	
241800	10.1	11.2		10.2			10.5	136	72		128			105	
	164.5	162.6		164.4			164.1								
250000	10.3				10.7	14.5	11.1	177			109	134	114		
	165.0				163.3	164.0	164.3								
250600	12.7	14.1		12.3			12.7	182	86		196		164		
	166.5	164.0		166.7			166.2								
251200	13.4	15.2		13.6	14.1	15.2	13.7	200	93		228	50	91	192	
	168.0	165.3		168.5	165.4	165.2	167.9								
251800	13.2	14.7		13.7			13.9	191	59		159		122		
	167.2	165.2		166.8			166.2								
260000	13.9	13.2	14.5	13.5	13.5		14.2	30	144	43	56	232	8		
	164.5	162.0	164.9	164.7	160.3		164.3								
260600	14.2	15.1	14.8	14.1				75	21	70	86				
	164.8	163.9	165.3	165.0											
261200	15.8	15.8	15.5	15.1	15.4	18.7	15.5	104	41	124	115	35	210	141	
	165.9	164.8	166.2	165.9	163.8	166.3	166.5								
261800	16.1	18.2	17.6	17.5			18.1	78	113	79	75		156		
	164.8	164.8	164.6	164.6			165.9								
270000	18.1	17.0	15.4	14.4	16.5		15.1	44	27	120	189	107	154		
	164.4	164.4	164.1	165.2	162.6		165.4								
270600	18.5	18.4	17.8	17.5			17.5	32	24	14	42		70		
	164.0	164.2	164.1	163.7			165.3								
271200	19.0	19.4	18.4	18.1	18.0	22.4	18.0	51	56	17	50	109	274	63	
	163.4	163.7	164.0	163.5	162.4	166.9	165.1								
271800	21.0	20.0	21.6	21.2			18.8	274	147	375	369		91		
	161.2	163.3	159.5	159.5			164.7								
280000	21.2	20.4	21.2	20.3	19.1	22.3	20.6	215	131	160	181	240	165	90	
	162.5	164.0	163.5	163.1	162.4	168.7	164.7								
280600	21.3	20.8	21.8	21.3			21.5	224	175	190	224		106		
	162.9	163.9	163.5	162.9			165.0								
281200	22.0	20.8	22.1	21.5	19.9	24.5		295	223	195	245	234	217		
	162.0	163.7	163.8	163.0	164.1	170.5									
281800	21.3							205							
	170.7														
290000	22.8	23.1		25.2	23.3	26.6	24.2	178	98		89	62	226	34	
	171.0	169.4		166.9	167.9	171.5	168.8								
290600	25.0	22.6		26.1			25.5	49	174		119		27		
	170.0	167.5		167.2			168.9								
291200	25.5	23.1		26.3	23.7	30.0		77	231		124	223	223		
	169.1	168.0		167.7	167.3	171.4									
291800	26.1	24.7		27.2				131	225		98				
	170.9	167.7		168.1											
300000	27.9	25.7		27.2				128	295		188				
	170.1	167.0		168.1											
300600	29.0	26.6		29.1				173	349		164				
	170.6	166.8		169.3											

AVERAGE DISTANCE ERRORS

141 133 126 149 140 193 102

HURRICANE NELE - October 23 - 29, 1985

DTG GMT	CPHC N/W	48 HOUR FORECAST POSITION					48 HOUR FORECAST ERROR							
		EP HC77 N/W	EP AN85 N/W	EP CL84 N/W	EP HC81 N/W	MFM N/W	NTCM N/W	CP HC NM	EP 77 NM	EP 85 NM	EP 84 NM	EP 81 NM	MFM NM	NTCM NM
		251800	10.5 169.4	12.4 164.2		11.2 168.1			11.4 168.3	388	126		302	
260000	10.8 170.2				11.5 164.6	15.1 167.3	12.1 168.2	409				170	186	268
260600	13.2 171.5	15.9 161.3		12.5 172.2			13.9 170.3	443	171		495			364
261200	13.9 174.3	17.3 160.6		14.6 173.8	15.0 164.2	16.3 168.0	15.0 172.1	603	218		567	54	226	466
261800	13.7 171.4	16.9 162.4		14.4 170.5			15.6 168.2	486	70		422			273
270000	16.0 167.8	15.3 161.7	21.4 162.5	13.5 167.1	15.6 158.2		16.2 165.5	223	191	259	288	362		104
270600	16.2 168.2	17.5 163.5	21.7 162.9	15.2 166.7				254	50	234	221			
271200	16.7 168.4	18.4 164.6	20.6 165.7	17.0 166.9	18.3 165.6	18.7 171.8	17.3 168.8	266	26	147	182	82	432	274
271800	17.8 165.2	18.6 166.6	20.6 162.4	20.1 163.9			20.2 167.9	127	82	203	114			115
280000	23.9 162.3	19.0 164.2	18.1 161.7	15.3 166.3	20.1 162.2		16.8 167.8	294	156	303	324	233		249
280600	23.5 161.0	20.1 165.1	21.3 162.0	20.1 163.2			19.4 167.4	346	135	274	226			135
281200	23.4 161.0	21.3 164.6	21.9 161.9	20.9 163.0	22.5 161.5	24.0 171.4	19.8 167.1	353	164	302	256	322	246	156
281800	25.3 156.6	22.2 166.0		24.0 156.4			22.1 166.3	619	115		622			106
290000	24.9 157.2	22.4 164.5	25.0 156.5	23.2 162.4	22.5 163.7	24.4 173.8	23.1 165.2	601	234	639	325	270	306	160
290600	24.1 158.7	22.0 162.6	25.6 156.4	25.2 161.0			25.4 166.6	570	403	689	440			137
291200	24.8 157.5	22.1 162.1	26.0 157.2	25.5 161.6	22.6 167.3	31.6 174.4		683	506	689	457	277	383	
291800	22.3 175.4							461						
300000	24.3 176.1	24.1 169.3		29.1 165.0	25.0 170.2	32.6 173.2	27.1 171.2	483	355		251	301	238	191
300600	28.0 173.0	20.0 165.9		30.2 164.9			29.2 170.2	282	738		270			157

AVERAGE DISTANCE ERRORS

415 220 374 339 230 288 216

HURRICANE NELE - October 23 - 29, 1985

DTG	CPHC	72 HOUR FORECAST POSITION						72 HOUR FORECAST ERROR						
		EP	EP	EP	EP	MFM	NTCM	CP	EP	EP	EP	EP	MFM	NTCM
		HC77	AN85	CL84	HC81			HC	77	85	84	81		
GMT	N/W	N/W	N/W	N/W	N/W	N/W	N/W	NM	NM	NM	NM	NM	NM	
261800	11.1	12.4		13.5			12.7	708	258		518			559
	174.3	163.8		171.9			172.3							
270000	11.7				10.8	17.2	13.3	714			418	401	504	
	175.0				166.5	171.2	171.8							
270600	13.3	15.9		11.7			15.2	764	293		807		582	
	176.5	159.6		176.5			173.9							
271200	14.0	17.4		13.5	15.9	18.0	15.9	950	344		815	271	344	662
	180.0	158.3		177.3	168.0	170.2	175.4							
271800	13.9	16.9		13.5			17.1	665	314		573		257	
	175.7	161.3		173.4			169.4							
280000	16.5	16.2		12.9	15.2		18.3	411	272		483	331	145	
	172.0	165.8		168.4	165.9		166.6							
280600	16.5	18.1		15.5				441	221		371			
	172.5	165.7		168.0										
281200	17.0	19.1	27.4	18.2	15.7	18.7	19.2	386	198	350	252	462	496	317
	171.0	167.3	164.0	167.3	171.3	175.2	171.8							
281800	19.0	21.9	20.6	22.1			21.0	259	130	294	98		192	
	167.3	169.5	163.3	166.5			170.1							
290000	27.0	20.2	18.4	16.2	17.3		19.3	627	277	503	531	439	349	
	157.0	165.9	161.8	164.4	170.5		171.4							
290600	27.8	21.8	24.2	22.5			21.0	748	227	553	364		260	
	155.5	167.1	159.0	163.1			170.6							
291200	28.3	23.9	24.8	23.9	17.7	26.7	21.2	827	318	614	431	530	258	318
	154.6	164.9	158.8	162.6	169.2	174.8	170.1							
291800	28.0	24.6		27.7			23.3	990	209		356		286	
	151.0	168.9		163.0			168.8							
300000	28.6	23.6		27.4	16.6	28.2	24.9	929	465		324	804	293	338
	152.0	164.8		164.3	170.1	174.9	167.0							
300600	26.6	23.1		29.6			29.7	859	670		370		133	
	154.5	161.9		163.1			169.0							

AVERAGE DISTANCE ERRORS

685 300 463 450 465 358 350

CENTRAL PACIFIC HURRICANE CENTER
VERIFICATION SUMMARY

HURRICANE NELE
October 23 - 29, 1985

CPHC MEAN ERROR FROM BEST TRACK 20NM

MEAN ERROR (ERROR (NM)/# OF CASES)

	24 HR FCST	48 HR FCST	72 HR FCST
CPHC	141/23	415/19	685/15
EPHC77	133/21	220/17	300/14
EPAN85	126/11	374/10	463/ 5
EPCL84	149/21	339/17	450/14
EPHC81	140/10	230/ 9	465/ 7
MFM	193/ 8	288/ 7	358/ 5
NTCM	102/16	216/16	350/14

CENTRAL PACIFIC HURRICANE CENTER
Annual Verification Summary

Average Seasonal Forecast Error*
(Average error (NM)/total number of forecasts)

<u>Year</u>	<u>Best Track</u>	<u>24-Hour</u>	<u>48-Hour</u>	<u>72-Hour</u>
1983	15/64	114/48	226/32	381/20
1984	14/31	105/23	189/15	240/9
1985	14/74	109/58	298/32	569/27

* For forecasts to be verified, system must have maintained tropical storm or hurricane intensity for a minimum of 24 hours in the central Pacific.

- No. 13 Forecasting Hurricanes in the Central Pacific. Paul Haraguchi. October 1975. (PB-248-371)
- No. 14 Trade Wind Speed Estimation at Selected Stations on Oahu Using Honolulu Wind Observations, A Pilot Study. Michael J. Morrow. February 1976. (PB-251-685)
- No. 15 An Experiment in the Production of "POP" Forecasts Using a Statistical Model. G. Hirata. September 1976. (PB-260-926)
- No. 16 Forecasting Floods in Hawaii (Excluding Hawaii Island). Paul Haraguchi. January 1977. (PB-265-939)
- No. 17 An Operational Swell and Surf Program Using the N.W.S. Automatic Data Acquisition System (ADAS) Computer System. E. M. Carlstead. May 1977. (PB-269-650)
- No. 18 An Operational Message Composition System Using the N.W.S. Automatic Data Acquisition System (ADAS) Computer System. G. H. Hirata April 1978. (PB-283-088)
- No. 19 A Program to Compute Turbulence in the Vicinity of Lee Waves Downstream of Selected Mountains in the Hawaiian Islands. Lawrence D. Burroughs. October 1978. (PB-289-792)
- No. 20 Application of the Zero Relative Vorticity Line in Synoptic Forecasting. Hans E. Rosendal. August 1979. (PB-300-790)
- No. 21 The Estimation of Cirrus Cloud Over Oahu. Michael J. Morrow. August 1980. (PB81-108-086)
- No. 22 1980 Tropical Cyclones - Central Pacific. Andrew K. T. Chun. March 1981. (PB81-198-699)
- No. 23 Some Mean Characteristics of Central North Pacific Tropical Cyclones. Hans E. Rosendal. June 1981. (PB81-230-492)
- No. 24 Relationship of Maximum Sustained Winds to Minimum Sea Level Pressure in Central North Pacific Tropical Cyclones. Hans E. Rosendal & Samuel L. Shaw. February 1982. (PB82-193-160)
- No. 25 1981 Tropical Cyclones - Central Pacific. Andrew K. T. Chun. February 1982. (PB82-195-306)
- No. 26 A Statistical Analysis of Ala Moana Surf Heights. Robert Y. G. Lee. May 1982. (PB82-229-196)
- No. 27 1982 Tropical Cyclones - Central Pacific. Andrew K. T. Chun. March 1984. (PB84-175-512)
- No. 28 Skywarn * Hawaii. Michael J. Morrow. December 1984. (PB86-107-505)
- No. 29 1983 Tropical Cyclones - Central North Pacific. W. Au, A. Chun, A. Inouye, H. Rosendal, T. Yamashiroya. December 1985. (PB86-158-185/AS)
- No. 30 1984 Tropical Cyclones - Central North Pacific. W. Au, A. Chun, A. Inouye, L. Iwai, H. Rosendal, T. Yamashiroya. March 1986. (PB86-183-951/AS)

NOAA CENTRAL LIBRARY
CIRC QC995 .U66 no.31
1985 tropical cyclones, ce



NOAA SCIENTIFIC AND TECHNICAL PUBLICATIONS

The National Oceanic and Atmospheric Administration was established as part of the Department of Commerce on October 3, 1970. The mission responsibilities of NOAA are to assess the socioeconomic impact of natural and technological changes in the environment and to monitor and predict the state of the solid Earth, the oceans and their living resources, the atmosphere, and the space environment of the Earth.

The major components of NOAA regularly produce various types of scientific and technical information in the following kinds of publications:

PROFESSIONAL PAPERS—Important definitive research results, major techniques, and special investigations.

CONTRACT AND GRANT REPORTS—Reports prepared by contractors or grantees under NOAA sponsorship.

ATLAS—Presentation of analyzed data generally in the form of maps showing distribution of rainfall, chemical and physical conditions of oceans and atmosphere, distribution of fishes and marine mammals, ionospheric conditions, etc.

TECHNICAL SERVICE PUBLICATIONS—Reports containing data, observations, instructions, etc. A partial listing includes data serials; prediction and outlook periodicals; technical manuals, training papers, planning reports, and information serials; and miscellaneous technical publications.

TECHNICAL REPORTS—Journal quality with extensive details, mathematical developments, or data listings.

TECHNICAL MEMORANDUMS—Reports of preliminary, partial, or negative research or technology results, interim instructions, and the like.



Information on availability of NOAA publications can be obtained from:

**PUBLICATION SERVICES BRANCH (E/A113)
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE**

Washington, DC 20235