NOAA TECHNICAL MEMORANDUM NWSTM PR-27

1982 TROPICAL CYCLONES - CENTRAL PACIFIC

Honolulu, HI
March 1984

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

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National Weather Service, Pacific Region Subseries

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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)

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Andrew K. T. Chun

Honolulu, HI
March 1984

UNITED STATES
DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary

National Oceanic and
Atmospheric Administration
John V. Byrne, Administrator

National Weather Service
Richard E. Hallgren,
Assistant Administrator

CENTRAL NORTH PACIFIC TROPICAL CYCLONE DATA, 1982[1]

NAME	DATES	MAXIMUM CLASS	MAXIMUM SUSTAINED WINDS (KT)	LOWEST PRESSURE (MB)	TOTAL HOURS OBSERVED
EMILIA	Jul 12-15	Tropical Storm	E55 (NESS)	N/A	48(TS), 12(TD)
DANIEL	Jul 16-22	Tropical Storm	E40 (NESS)	N/A	72(TS), 78(TD)
GILMA	Jul 30 - Aug 1	Hurricane	E75 (NESS)	N/A	6(H), 42(TS), 18(TD)
JOHN	Aug 6-10	Hurricane	E100 (NESS)	N/A[2]	52(H), 24(TS), 30(TD)
KRISTY	Aug 11-16	Hurricane	E75 (NESS, RECCE)	982 (RECCE)	36(H), 84(TS), 12(TD)
AKONI	Aug 29 - Sep 2	Tropical Storm	E45 (NESS)	N/A	54(TS), 24(TD)
MIRIAM	Sep 4-6	Tropical Storm	E45 (NESS)	N/A	18(TS), 36(TD)
EMA	Sep 15-18	Tropical Storm	E40 (NESS)	N/A	60(TS), 18(TD)
HANA	Sep 15-18	Tropical Storm	E35 (NESS)	N/A	42(TS), 36(TD)
IWA	Nov 19-24	Hurricane	E80 (NESS, RECCE)	964 (RECCE)	42(H), 90(TS)

KEY

H Hurricane

TS Tropical Storm

TD Tropical Depression

Total hours observed per class:

H 36

TS 84

TD 12

[1]Data pertains only to period storm was in the central Pacific.

[2]Recconnaissance flown after storm had peaked and was weakening.

TROPICAL STORM EMILIA - July 12-15, 1982

EMILIA began as T.D. 9E near 10.0N 136.5W on July 12, 1982. The Eastern Pacific Hurricane Center (EPHC) issued its first advisory on T.D. 9E at 121500 GMT. At that time, the depression had maximum sustained winds estimated at 30 knots. T.D. 9E continued to intensify and was upgraded to a tropical storm and named EMILIA on the ensuing bulletin with maximum sustained winds of 35 knots.

EMILIA moved westward at 10-12 knots and crossed 140W about 130300 GMT. The Central Pacific Hurricane Center (CPHC) assumed forecast responsibility for EMILIA at this time and issued its first advisory on the storm at 130900 GMT. During the next 24 hours, she moved on a west northwesterly course and intensified to a storm with maximum sustained winds estimated at 55 knots (Fig. 1). As she approached 150W, EMILIA began to feel the effects of the upper level trough that was lying over the Hawaiian Islands to the northwest of her center.

She began to weaken rapidly due to the shearing of her upper level circulation by the southwesterlies aloft and was downgraded to a tropical depression at 151200 GMT. Her demise was rapid and the CPHC issued its last advisory on EMILIA at 152100 GMT.

The CPHC issued 11 advisories on the storm. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 2) verify the 24-hour CPHC forecast and forecasts from the EPHC77, EPANLG, and EPCLPR models. Statistical computations on the 48-hour forecasts were not made due to an insufficient number of cases. All computes were made from the best track positions.

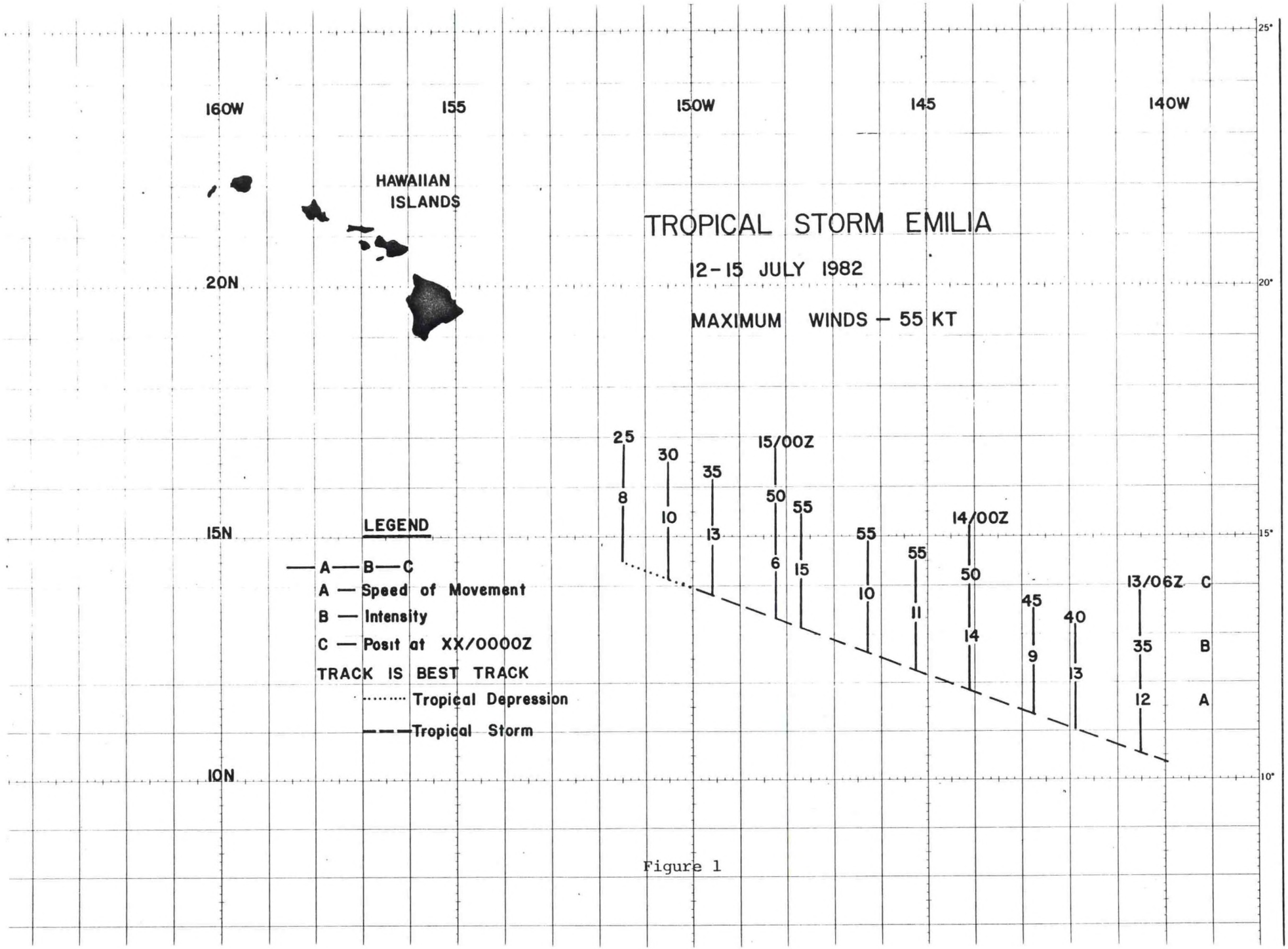
160W
155
150W
145
140W
25°
20°
15°
10°
20N
15N
10N
HAWAIIAN
ISLANDS
TROPICAL STORM EMILIA
12-15 JULY 1982
MAXIMUM WINDS — 55 KT
LEGEND
— A — B — C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
····· Tropical Depression
– – – Tropical Storm
25
8
30
10
35
13
15/00Z
50
6
55
15
55
10
55
11
14/00Z
50
14
45
9
40
13
13/06Z C
35 B
12 A

Figure 1

TROPICAL STORM EMILIA - July 12-15, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
1306	10.5N 140.5W	10.5N 140.5W	0																				
1312	11.0N 141.9W	10.8N 142.0W	13																				
1318	11.4N 142.8W	11.1N 142.9W	19	-																			
1400	11.9N 144.1W	11.8N 144.1W	6					9.8N 143.6W					129										
1406	12.3N 145.3W	12.3N 145.3W	0	11.2N 145.6W	-	-	-	-	68	-	-	-											
1412	12.6N 146.3W	12.8N 146.3W	12	11.2N 146.9W	11.9N 146.8W	11.9N 146.6W	11.9N 146.9W	10.4N 144.9W	91	51	45	55	155										
1418	13.2N 147.7W	13.2N 147.8W	6	12.0N 147.9W	12.3N 147.5W	12.3N 147.2W	12.3N 147.4W		73	55	61	54											
1500	13.4N 148.2W	13.6N 148.2W	12	12.8N 149.0W	13.3N 148.4W	13.1N 148.3W	13.5N 148.2W	11.1N 147.5W	59	13	19	6	143					10.3N 146.8W					203
1506	13.8N 149.6W	13.9N 149.8W	13	13.2N 150.7W	14.5N 149.8W	14.1N 149.4W	14.7N 149.7W		73	43	21	54		11.8N 150.0W	-	-	-		122				
1512	14.1N 150.5W	14.5N 150.4W	24	13.2N 150.4W	14.1N 150.6W	14.4N 150.3W	14.2N 150.4W	13.3N 151.5W	54	6	21	8	75	11.7N 151.5W	12.0N 150.5W	13.3N 151.0W	12.3N 150.6W	11.2N 148.6W	155	126	56	108	206
1518	14.4N 151.4W	14.5N 151.4W	6	13.7N 153.0W	14.3N 152.6W	14.8N 152.0W	14.3N 152.4W		102	70	42	58		12.9N 153.0W	12.4N 151.3W	13.8N 151.5W	12.8N 150.8W		129	120	36	103	

* CPHC Mean Vector Error = 10.1 NM
  Number of cases: 11

CPHC Mean 24-hr Error = 74.3 NM
  Number of cases: 7

* The vector error is the distance of the initial position from the best track

EPHC77 Mean 24-hr Error = 39.7 NM
EPANLG Mean 24-hr Error = 34.8 NM
EPCLPR Mean 24-hr Error = 39.2 NM
  Number of cases: 6

MFM Mean 24-hr Error = 125.5 NM
  Number of cases: 4

Figure 2

TROPICAL STORM DANIEL - July 16-22, 1982

DANIEL began as T.D. 8E on July 7, 1982. The Eastern Pacific Hurricane Center (EPHC) issued its first advisory on the budding tropical cyclone at 071500 GMT. T.D. 8E intensified rapidly and was upgraded to a tropical storm and named DANIEL at 081800 GMT. Moving toward the west northwest, DANIEL intensified slowly and was upgraded to a hurricane at 100000 GMT. He continued to intensify and reached peak intensity with maximum sustained winds of 100 knots at 111200 GMT near 14.5N 115.0W. Peak intensity was maintained for approximately 12 hours. As he continued westward, DANIEL slowly weakened and was downgraded to a tropical storm at 150600 GMT.

DANIEL crossed 140W and into the Central Pacific Hurricane Center's (CPHC) area of responsibility as a minimum tropical storm with maximum sustained winds of 35 knots on a heading of 260 degrees. The CPHC issued its first advisory on DANIEL at 162100 GMT. He continued on a south of west course as a weak tropical storm for the next 72 hours and was finally downgraded to a tropical depression at 191800 GMT when he was approximately 280 miles south southwest of South Point, Hawaii. By this time, he was well under the influence of the same upper level trough that caused EMILIA's demise a few days earlier. His movement slowed to a standstill for approximately 18 hours before he began to drift slowly northward toward the island of Hawaii (Fig. 3). Early on the morning of July 22, DANIEL skirted the west coast of Hawaii and dissipated in the Alenuihaha Channel between the islands of Maui and Hawaii.

DANIEL's positions and intensities while in the CPHC's area were determined almost entirely by satellite fixes and estimations using the DVORAK technique. However, the existence of a surface circulation when he was quasi-stationary and in a weakened state was verified by the ship GTVU. The ship reported a surface wind of 010 degrees 20 knots approximately 150 miles west of the depression's center at 200600 GMT. GTVU was moving northwest at 20 knots and quickly moved away from DANIEL who had begun to drift northward at a speed of 3 to 5 knots.

The CPHC issued 25 advisories on the storm. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 4) verify the 24, 48, and 72-hour CPHC forecasts and the forecasts from the EPHC77, EPANLG, and EPCLPR models. Statistical computations on the MFM forecasts were not made due to an insufficient number of cases. All computes were made from the best track positions.

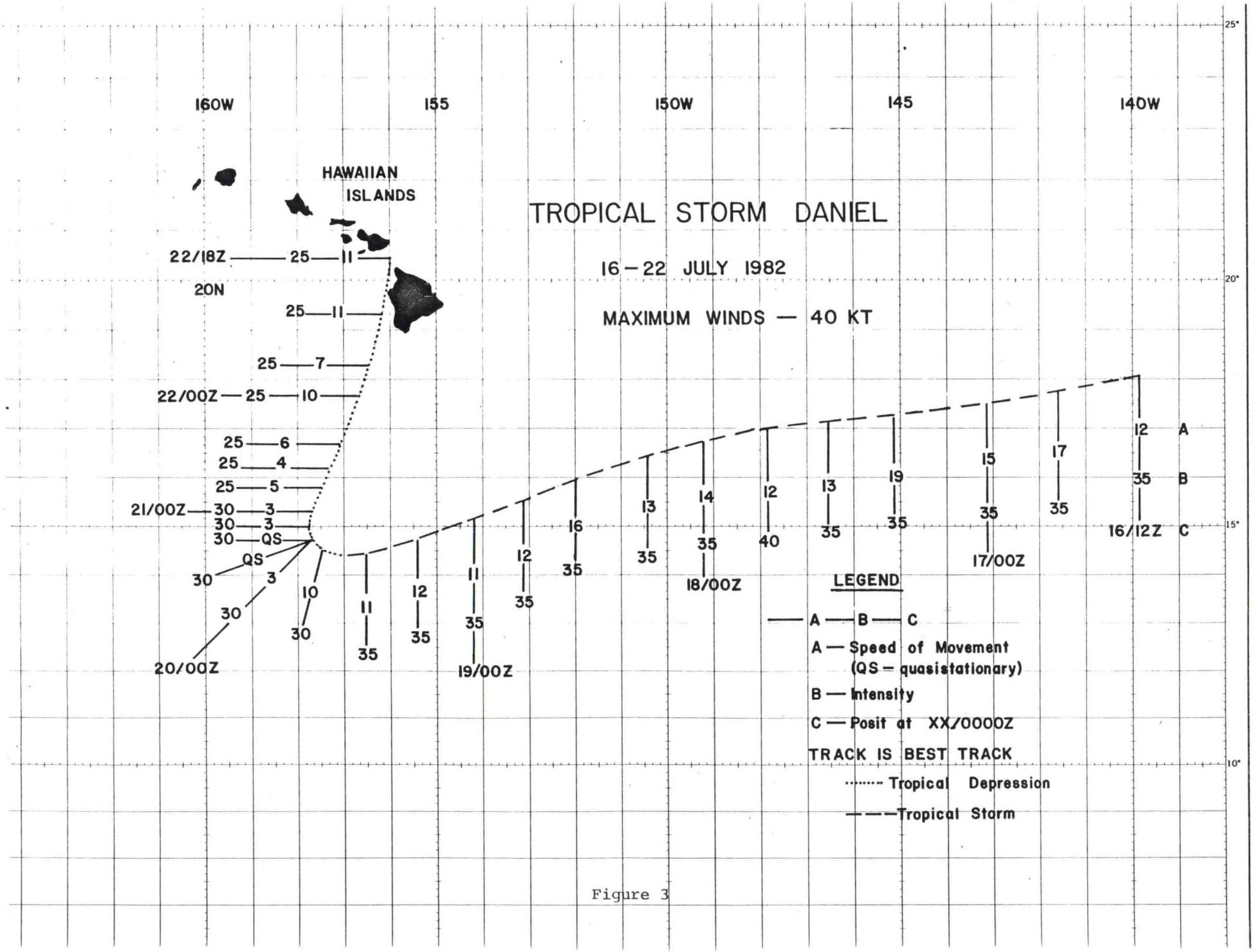
160W
155
150W
145
140W
25°
20°
15°
10°
HAWAIIAN
ISLANDS
TROPICAL STORM DANIEL
16 – 22 JULY 1982
MAXIMUM WINDS — 40 KT
22/18Z — 25 — 11
20N
25 — 11
25 — 7
22/00Z — 25 — 10
25 — 6
25 — 4
25 — 5
21/00Z — 30 — 3
30 — 3
30 — QS
QS
30
3
30
10
30
11
35
12
35
11
35
19/00Z
20/00Z
12
35
16
35
13
35
14
35
18/00Z
12
40
13
35
19
35
15
35
17/00Z
17
35
12 A
35 B
16/12Z C
LEGEND
— A — B — C
A — Speed of Movement
(QS — quasistationary)
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
····· Tropical Depression
— — — Tropical Storm

Figure 3

TROPICAL STORM DANIEL - July 16-22, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)					72-HOUR FORECAST POSITION					72-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
	17.8N	17.8N																														
1618	141.6W	141.6W	0																													
	17.5N	17.5N																														
1700	143.1W	143.1W	0																													
	17.3N	17.3N																														
1706	145.1W	145.1W	0																													
	17.2N	17.1N																														
1712	146.5W	146.5W	6																													
	17.0N	17.1N		17.5N	17.2N	18.4N	17.4N																									
1718	147.8W	147.8W	6	147.5W	147.1W	146.1W	147.1W		35	42	129	47																				
	16.7N	17.0N		17.5N	16.9N	18.0N	16.9N																									
1800	149.2W	149.2W	18	149.5W	149.0W	147.8W	149.1W		51	17	112	14																				
	16.5N	16.6N		17.5N	16.9N	17.2N	17.0N																									
1806	150.4W	150.4W	6	151.0W	151.7W	150.4W	151.5W		69	79	42	70																				
	16.0N	16.2N		17.3N	17.0N	17.1N	17.1N																									
1812	152.0W	152.2W	17	152.5W	153.0W	152.3W	153.0W		83	83	68	88																				
	15.6N	15.5N		17.2N	17.1N	17.7N	17.2N							17.7N	17.2N	19.1N	17.1N															
1818	153.1W	153.1W	6	152.7W	153.5W	152.7W	153.6W		99	93	128	100		153.0W	151.3W	150.3W	152.2W		126	141	264	104										
	15.2N	15.0N		17.4N	17.3N	17.6N	17.4N							18.0N	16.5N	18.6N	16.4N															
1900	154.2W	154.1W	14	154.6W	154.9W	154.0W	155.0W		134	132	144	140		155.5W	153.3W	151.9W	154.6W		184	94	243	76										
	14.8N	15.0N		17.2N	16.0N	17.1N	16.2N							18.2N	16.9N	17.5N	16.9N															
1906	155.4W	155.6W	17	155.7W	155.8W	154.6W	155.8W		145	76	146	87		157.0W	155.9W	155.3W	157.2W		224	129	162	163										
	14.5N	14.7N		15.8N	15.2N	16.2N	15.2N							18.3N	17.2N	17.3N	17.4N															
1912	156.5W	156.5W	13	157.2W	157.5W	156.7W	157.7W		88	72	103	81		158.5W	156.9W	157.1W	158.6W		255	164	172	212										
	14.6N	14.5N		14.9N	14.4N	15.0N	14.3N							18.3N	17.4N	18.5N	17.6N							18.4N	18.0N	19.9N	17.7N					
1918	157.5W	157.5W	6	158.0W	158.4W	157.3W	158.8W		34	54	27	78		157.7W	157.6W	156.8W	158.6W		222	168	237	191		158.5W	156.1W	154.1W	156.5W		235	219	373	195	
	14.7N	14.5N		14.5N	14.0N	14.4N	13.8N	13.4N						18.8N	17.6N	18.3N	17.8N							18.8N	17.1N	19.4N	16.5N					
2000	157.7W	157.7W	13	158.8W	158.8W	158.6W	159.2W	156.5W	65	77	55	103	105	159.6W	159.0W	159.2W	160.1W		269	189	233	232		161.5W	158.7W	155.9W	159.6W		329	155	300	154	
	14.7N	14.5N		15.0N										18.5N	15.8N	17.8N	15.8N							19.3N	17.4N	18.0N	17.8N					
2006	157.7W	158.0W	21	160.3W	M	M	M		152	M	M	M		160.8W	160.0W	158.8W	160.9W		289	149	196	197		163.0W	161.2W	159.8W	162.1W		411	259	232	314	
	14.7N	14.5N		14.7N	15.1N	14.4N	15.3N							16.0N	14.7N	16.7N	14.4N							19.6N	18.0N	17.8N	18.7N					
2012	157.7W	158.0W	21	161.3W	161.0W	160.7W	161.5W		209	193	175	223		161.5W	161.6W	161.6W	163.2W		233	226	255	320		164.5W	162.3W	162.6W	163.4W		488	331	338	406	
	15.0N	15.0N		14.5N	14.3N	14.6N	14.5N							15.0N	13.8N	15.4N	13.3N							19.0N	18.2N	19.3N	18.7N					
2018	157.8W	157.5W	18	161.6W	161.7W	161.8W	162.1W		223	230	233	251		163.0W	162.2W	161.7W	164.1W		301	266	227	380		162.7W	162.6W	161.7W	163.3W		370	336	341	386	
	15.3N	15.2N		14.5N	15.0N	15.4N	15.2N	14.1N						14.9N	13.6N	15.0N	13.2N	14.5N						19.0N	18.4N	19.3N	19.0N					
2100	157.7W	157.5W	14	161.4W	161.3W	161.4W	161.1W	157.6W	220	209	214	197	72	162.9W	162.6W	163.4W	164.0W	156.2W	302	302	331	387	99	164.6W	164.1W	163.1W	165.0W		454	412	391	474	
	15.8N	15.6N		14.5N	15.2N	15.2N	15.2N							15.5N										18.5N	16.0N	18.7N	16.2N					
2106	157.5W	157.1W	26	160.8W	159.9W	161.0W	160.1W		206	143	206	155		164.2W	M	M	M		387	M	M	M		166.3W	164.7W	163.1W	165.1W		530	416	365	439	
	16.2N	16.0N		14.5N	15.5N	15.4N	15.4N							15.2N	15.0N	15.0N	15.3N							16.5N	15.2N	17.5N	14.4N					
2112	157.3W	157.0W	21	160.2W	159.1W	160.4W	159.5W		196	112	185	136		166.0W	164.7W	165.3W	166.0W		506	434	468	505		166.5W	166.3W	166.6W	167.2W		530	523	540	583	
	16.7N	16.6N		16.2N	17.0N	16.2N	16.8N							14.7N	14.3N	15.4N	16.8N							15.2N	14.5N	17.0N	13.4N					
2118	157.1W	156.8W	19	158.5W	156.9W	158.6W	157.3W		86	22	91	14		165.6W	165.5W	166.6W	171.7W		505	506	553	839		168.0W	166.4W	167.2W	167.6W		635	553	580	640	
	17.6N	17.8N		15.3N	17.6N	16.4N	17.4N	17.3N						14.5N	15.5N	16.6N	15.3N	16.6N						15.5N	14.6N	16.4N	14.1N					
2200	156.7W	156.9W	17	157.5W	156.8W	158.6W	157.2W	155.1W	146	7	131	31	93	165.0W	164.8W	165.5W	164.5W	156.8W	513	483	508	470	60	167.0W	165.5W	169.6W	166.4W		606	538	744	598	
	18.3N	18.3N		17.6N	17.8N	16.9N	17.6N							14.5N	15.9N	16.3N	15.4N							16.3N								
2206	156.5W	156.5W	0	158.7W	156.9W	157.7W	157.3W		132	38	108	62		163.7W	162.2W	164.8W	162.8W		483	357	490	401		168.2W	M	M	M		681	M	M	M	
	19.3N	19.3N		17.5N	17.7N	17.2N	17.5N							15.3N	16.3N	16.6N	15.8N							16.7N	16.2N	16.4N	16.6N					
2212	156.2W	156.2W	0	157.6W	157.4W	157.8W	157.9W		134	118	156	145		163.1W	160.7W	163.8W	161.7W		462	314	463	378		170.7W	168.1W	170.5W	169.6W		842	705	835	782	
	20.4N	20.4N		18.5N	19.4N	18.1N	19.0N							17.3N	18.2N	17.4N	17.7N							15.5N	15.1N	16.8N	15.1N					
2218	156.0W	156.0W	0	156.6W	156.8W	157.3W	157.3W		119	75	156	112		160.7W	157.3W	160.8W	158.5W		325	151	327	215		169.6W	165.4W	171.7W	169.2W		830	776	918	818	

* CPHC Mean Vector Error = 11.4 NM
Number of cases: 25
CPHC Mean 24-hr Error = 125.1 NM
Number of cases: 21
CPHC Mean 48-hr Error = 328.6 NM
Number of cases: 17
CPHC Mean 72-hr Error = 533.9 NM
Number of cases: 13
* The vector error is the distance of the initial position from the best track.

EPHC77 Mean 24-hr Error = 93.6 NM
EPANLG Mean 24-hr Error = 130.5 NM
EPCLPR Mean 24-hr Error = 106.7 NM
Number of cases: 20

EPHC77 Mean 48-hr Error = 254.6 NM
EPANLG Mean 48-hr Error = 320.6 NM
EPCLPR Mean 48-hr Error = 316.9 NM
Number of cases: 16

EPHC77 Mean 72-hr Error = 435.3 NM
EPANLG Mean 72-hr Error = 496.4 NM
EPCLPR Mean 72-hr Error = 482.4 NM
Number of cases: 12

Figure 4

HURRICANE GILMA - July 30 to August 1, 1982

GILMA came to life as T.D. 13E near 9.5N 117.5W on July 26, 1982. The first advisory by the Eastern Pacific Hurricane Center was issued at 260900 GMT. Moving on a slightly north of west course, T.D. 13E intensified into a tropical storm and was named GILMA at 261800 GMT. She continued to intensify as she moved toward the west northwest and was upgraded to a hurricane at 280600 GMT with maximum sustained winds estimated at 65 knots. Peak intensity was reached about 36 hours later at 291800 GMT near 15.6N 135.9W when maximum sustained winds were estimated to be 110 knots. From this point on, she increased her forward speed to about 17 knots and began to slowly weaken.

She crossed 140W at approximately 300900 GMT with maximum sustained winds estimated at 75 to 85 knots. The Central Pacific Hurricane Center issued its first advisory at 301500 GMT. GILMA continued to weaken and was downgraded to a tropical storm at 301800 GMT. During her trek through the CPHC area, she had an average movement of 17.5 knots. This rate of movement is nearly double the average climatological speed with which tropical cyclones move across this area (Fig. 5). GILMA as with most tropical cyclones which approached the Hawaiian Islands in 1982, met her demise under the upper level westerlies associated with the Tropical Upper Tropospheric Trough (TUTT). The TUTT was a semi-permanent upper level feature near the Hawaiian Islands throughout the 1982 tropical cyclone season. She was downgraded to a tropical depression at 011200 GMT. The last advisory was issued by the CPHC at 020300 GMT.

The CPHC issued 11 advisories on the storm. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 6) verified the 24-hour CPHC forecast and forecasts from the EPHC77, EPANLG, and EPCLPR models. Statistical computations on the MFM and 48-hour forecasts were not made due to an insufficient number of cases. All computes were made from the best track positions.

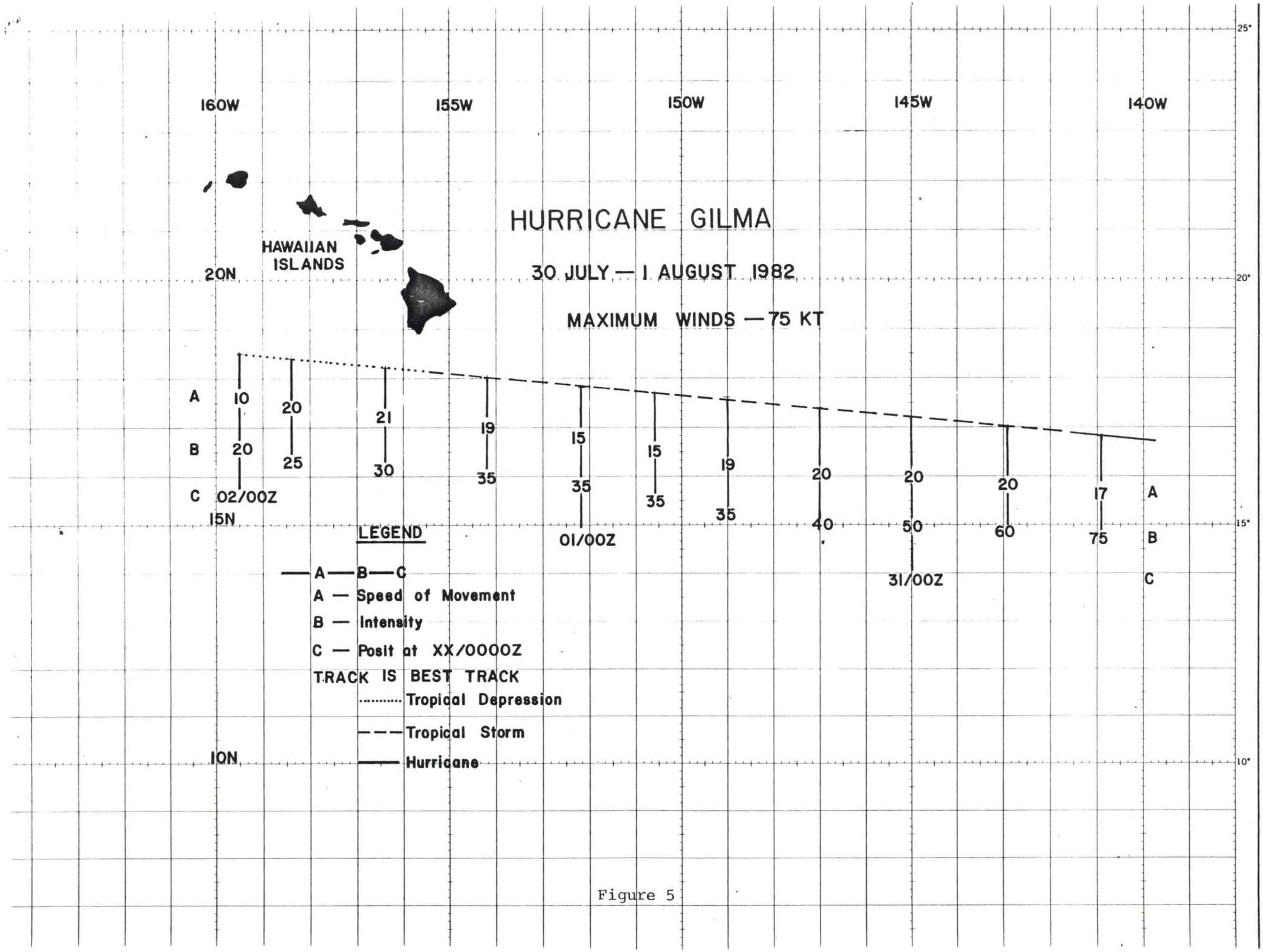
160W
155W
150W
145W
140W
25°
20°
15°
10°
HAWAIIAN ISLANDS
20N
HURRICANE GILMA
30 JULY — 1 AUGUST 1982
MAXIMUM WINDS — 75 KT
A
B
C
10
20
02/00Z
20
25
21
30
19
35
15
35
01/00Z
15
35
19
35
20
40
20
50
31/00Z
20
60
17
75
A
B
C
15N
LEGEND
A — B — C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
Tropical Depression
Tropical Storm
Hurricane
10N

Figure 5

HURRICANE GILMA - July 30-August 1, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
3012	16.8N 140.9W	17.0N 140.9W	12																				
3018	17.0N 142.9W	17.0N 142.9W	0																				
3100	17.2N 145.0W	17.0N 145.0W	12																				
3106	17.4N 147.0W	17.0N 147.0W	24																				
3112	17.6N 149.0W	17.0N 149.0W	36	18.8N 147.3W	18.1N 146.1W	18.5N 146.3W	18.1N 146.9W	19.1N 146.1W	120	168	163	123	188										
3118	17.7N 150.6W	17.5N 150.6W	12	18.2N 149.6W	17.5N 148.5W	18.4N 148.4W	17.4N 149.3W		65	120	132	76											
0100	17.8N 152.2W	17.9N 152.2W	6	17.4N 151.9W	16.6N 151.3W	18.1N 150.3W	16.5N 151.8W		30	88	110	81											
0106	18.0N 154.2W	18.0N 154.2W	0	17.2N 153.0W	16.9N 153.6W	18.0N 152.3W	16.9N 154.1W		83	74	108	66											
0112	18.2N 156.4W	18.0N 156.4W	0	17.0N 157.0W	17.3N 155.9W	17.5N 155.2W	17.4N 156.4W		79	61	80	48		18.8N 147.3W	18.7N 149.3W	19.8N 150.6W	19.0N 151.2W		518	405	342	299	
0118	18.4N 158.4W	18.3N 158.4W	6	17.8N 156.8W	18.6N 157.3W	18.5N 156.4W	18.6N 157.7W		98	63	114	41		21.0N 154.4W	17.5N 152.2W	19.5N 152.7W	17.8N 154.4W		274	357	330	230	
0200	18.5N 159.5W	18.5N 159.5W	0	18.4N 159.2W	19.3N 158.5W	18.9N 157.5W	19.4N 158.7W		18	74	116	70		17.2N 158.2W	15.9N 155.0W	19.2N 154.8W	16.2N 157.9W		107	301	270	165	

* CPHC Mean Vector Error = 10.9 NM
Number of cases: 11

CPHC Mean 24-hr Error = 70.4 NM
Number of cases: 7

* The vector error is the distance of the initial position from the best track

EPHC77 Mean 24-hr Error = 92.6 NM
EPANLG Mean 24-hr Error = 117.6 NM
EPCLPR Mean 24-hr Error = 76.4 NM

Number of cases: 7

Figure 6

HURRICANE JOHN - August 6-10, 1982

As with many of the tropical cyclones that passed from the eastern into the central Pacific in 1982, John formed in an unusually active area of the ITCZ between 120W and 140W. John began as T.D. 16E on August 3, 1982 near 11.4N 126.5W. The Eastern Pacific Hurricane Center issued its first advisory on T.D. 16E at 040300 GMT. The depression moved westward and intensified into a tropical storm and named JOHN at 041800 GMT. Within 24 hours, JOHN became a full-fledged hurricane with maximum sustained winds estimated at 70 knots.

JOHN continued to intensify and crossed 140W into the Central Pacific Hurricane Center's area of responsibility with maximum sustained winds estimated at 100 knots. The CPHC issued its first advisory at 062100 GMT. JOHN remained a steady state hurricane for another 30 hours before he began to weaken. He was downgraded to a tropical storm on the 090300 GMT advisory based on Air Force reconnaissance into his center at 090029 GMT. The reconnaissance weather officer estimated maximum sustained winds at the surface of 40 knots 25 nautical miles from his center on a bearing of 090 degrees. The sea level pressure at his center was determined by dropsonde and correlated well with the estimated maximum surface winds. During his entire life span, JOHN moved on a slightly north of west course (Fig. 7) and as a tropical depression passed 180 miles south of the island of Hawaii.

JOHN met his demise, as did his 3 predecessors, under the influence of the Tropical Upper Tropospheric Trough (TUTT) that was nearly stationary in the vicinity of the Hawaiian Islands during the entire tropical cyclone. His upper level cloudiness and convection was sheared off by the southwesterlies aloft and the remnant low level circulation carried westward by the easterlies.

The CPHC issued its last advisory on JOHN at 110300 GMT. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 8) verify the 24, 48, and 72-hour CPHC forecasts and the forecasts by the EPHC77, EPANLG, and EPCLPR models. All computations were made from the best track positions.

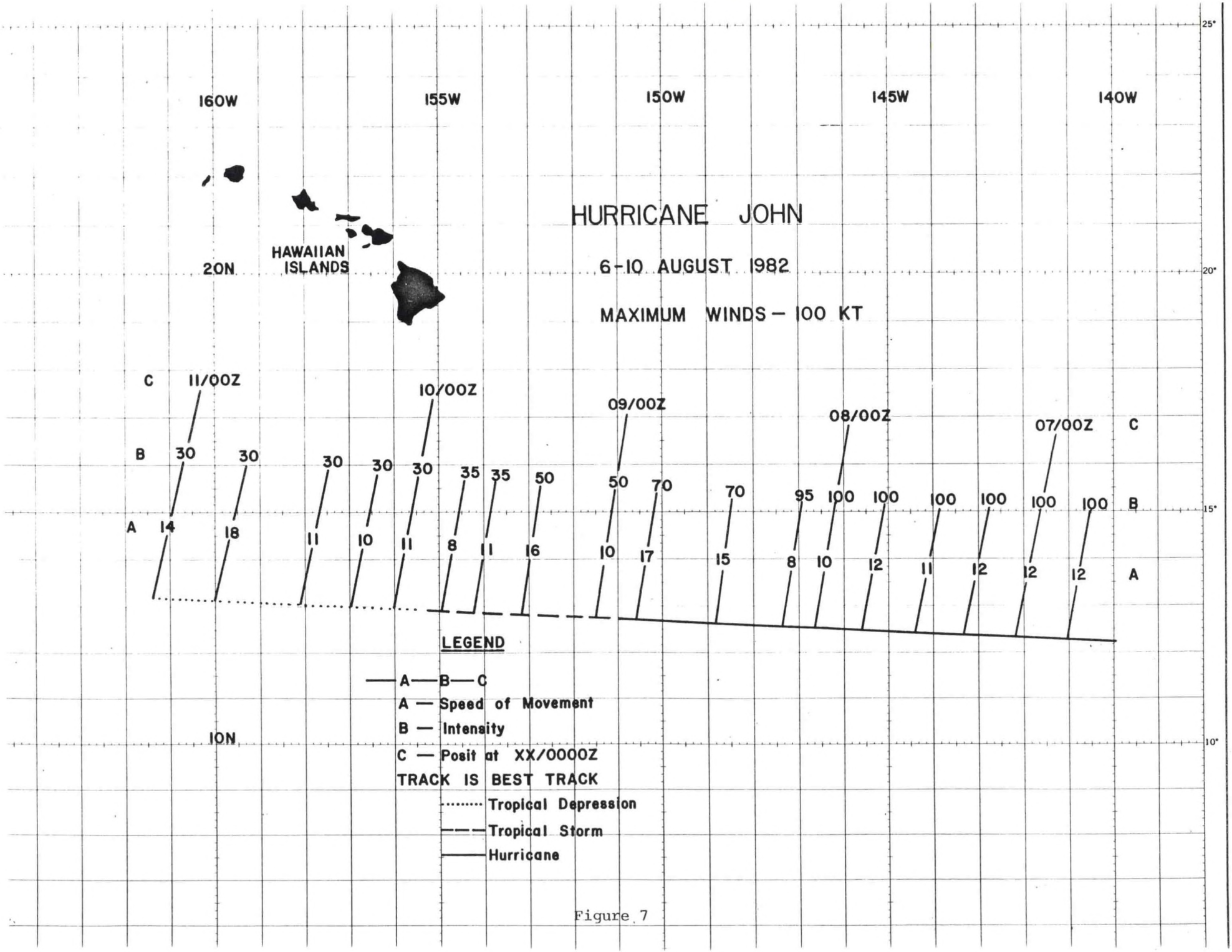
160W
155W
150W
145W
140W
25°
20°
15°
10°
20N
10N
HAWAIIAN ISLANDS
HURRICANE JOHN
6-10 AUGUST 1982
MAXIMUM WINDS — 100 KT
C 11/00Z
10/00Z
09/00Z
08/00Z
07/00Z
C
B 30 30 30 30 30 35 35 50 50 70 70 95 100 100 100 100 100 100 B
A 14 18 11 10 11 8 11 16 10 17 15 8 10 12 11 12 12 12 A
LEGEND
— A — B — C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
····· Tropical Depression
– – – Tropical Storm
——— Hurricane

Figure 7

HURRICANE JOHN - August 6-10, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)					72 -HOUR FORECAST POSITION					72-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
	12.3N	12.2N																														
0618	141.0W	141.0W	6																													
	12.3N	12.2N																														
0700	142.2W	142.2W	6																													
	12.4N	12.3N																														
0706	143.3W	143.3W	6																													
	12.4N	12.4N																														
0712	144.4W	144.4W	0																													
	12.5N	12.5N		12.3N	12.2N	13.3N	12.4N																									
0718	145.6W	145.6W	0	145.8W	145.7W	145.5W	145.7W		17	19	48	8																				
	12.5N	12.7N		12.5N	12.6N	13.2N	12.8N																									
0800	146.7W	146.7W	12	146.7W	146.8W	146.5W	146.8W		5	8	44	19																				
	12.6N	12.9N		12.6N	13.0N	13.3N	13.1N																									
0806	147.4W	147.4W	10	147.8W	147.8W	147.7W	147.8W		24	34	46	38																				
	12.7N	12.9N		12.8N	12.7N	13.2N	12.7N																									
0812	148.9W	148.9W	12	149.0W	149.6W	148.7W	149.8W		8	41	32	53																				
	12.7N	13.2N		13.3N	13.3N	13.6N	13.4N							13.3N	12.7N	14.6N	12.8N															
0818	150.6W	150.6W	30	149.9W	150.1W	149.9W	150.1W		55	46	68	51		150.7W	149.8W	149.8W	149.8W		37	47	123	47											
	12.8N	13.0N		13.9N	13.5N	13.9N	13.6N							13.5N	13.2N	14.5N	13.4N															
0900	151.5W	151.5W	12	151.1W	151.6W	151.3W	151.5W		70	43	67	48		151.0W	150.8W	150.8W	150.7W		51	48	110	59											
	12.8N	13.0N		13.8N	13.5N	13.9N	13.6N							14.0N	13.6N	14.7N	13.7N															
0906	153.2W	153.2W	12	151.3W	151.6W	151.3W	151.5W		126	103	129	110		152.2W	151.7W	151.9W	151.7W		93	100	137	103											
	12.8N	13.0N		13.8N	13.6N	14.1N	13.7N	13.7N						14.2N	13.1N	14.5N	13.2N															
0912	154.3W	154.3W	12	152.8W	153.3W	153.0W	153.2W	153.3W	106	76	109	84	80	153.2W	153.4W	152.9W	154.1W		106	56	131	27											
	12.9N	12.8N		13.9N	13.9N	14.4N	13.9N							14.7N	13.8N	14.9N	14.0N							14.9N	12.7N	16.0N	13.1N					
0918	155.0W	155.0W	7	155.9W	156.1W	154.9W	156.2W		80	88	90	92		154.2W	154.0W	154.1W	153.7W		118	80	131	101		155.3W	153.4W	153.9W	152.8W		121	94	197	129	
	12.9N	12.7N		13.0N	13.6N	14.1N	13.6N							14.9N	13.9N	15.2N	14.1N							14.9N	13.6N	15.9N	13.9N					
1000	156.1W	156.1W	12	156.0W	156.5W	155.9W	156.4W		8	48	73	46		155.5W	155.5W	155.7W	155.4W		125	70	140	83		155.3W	154.4W	154.6W	153.7W		129	108	200	152	
	13.0N	12.6N		13.2N	13.2N									14.8N	14.1N	15.2N	14.1N							15.0N	14.1N	16.1N	14.3N					
1006	157.0W	157.0W	24	157.8W	158.1W	M	M		48	65	M	M		155.2W	155.5W	155.7W	155.4W		151.	110	152	114		156.4W	155.3W	156.0W	154.7W		125	119	195	155	
	13.1N	12.6N		13.2N	13.7N	14.2N	14.6N							14.5N	14.0N	15.4N	14.2N	15.9N						15.0N	13.0N	15.9N	12.3N					
1012	158.1W	158.1W	30	159.0W	159.5W	163.3W	167.3W		53	89	310	543		156.8W	157.1W	157.1W	156.8W	159.0W	113	80	150	101	176	157.4W	157.8W	156.8W	158.3W		121	19	184	50	
	13.2N	13.7N		12.9N	12.3N	13.0N	12.5N							14.6N	14.2N	15.8N	14.3N							15.0N	14.2N	16.3N	14.3N					
1018	160.0W	160.0W	30	159.6W	159.2W	159.6W	159.2W		30	72	27	63		161.3W	160.1W	159.2W	160.4W		113	60	163	70		158.7W	157.5W	158.0W	156.7W		132	158	219	203	
	13.3N	13.7N		12.9N	12.7N	13.7N	12.9N							13.2N	14.0N	15.5N	14.1N							15.0N	14.3N	16.6N	14.4N					
1100	161.4W	161.4W	24	160.5W	160.3W	160.4W	160.3W		58	74	63	69		160.4W	160.4W	160.1W	160.3W		59	72	152	80		160.0W	159.5W	159.8W	159.0W		131	126	219	155	

* CPHC Mean Vector Error = 14.4 NM
Number of cases: 18
CPHC Mean 24-hr Error = 49.1 NM
Number of cases: 14
CPHC Mean 48-hr Error = 96.6 NM
Number of cases: 10
CPHC Mean 72-hr Error = 126.5 NM
Number of cases: 6

*The vector error is the distance of the initial position from the best track.

EPHC77 Mean 24-hr Error = 57.6 NM (14)
EPANLG Mean 24-hr Error = 85.1 NM (13)
EPCLPR Mean 24-hr Error = 94.2 NM (13)

EPHC77 Mean 48-hr Error = 72.3 NM (10)
EPANLG Mean 48-hr Error = 138.9 NM (10)
EPCLPR Mean 48-hr Error = 78.5 NM (10)

EPHC77 Mean 72-hr Error = 104.0 NM (6)
EPANLG Mean 72-hr Error = 202.3 NM (6)
EPCLPR Mean 72-hr Error = 140.7 NM (6)

( ) Number of cases

Figure 8

HURRICANE KRISTY - August 11-16, 1982

KRISTY came to life as T.D. 17E on August 8, 1982. She formed in the ITCZ approximately 220 miles southeast of the area where JOHN was spawned near 9.5N 122.7W. The Eastern Pacific Hurricane Center issued its first advisory on T.D. 17E at 081800Z. Moving westward, the tropical depression intensified and became a tropical storm named KRISTY at 090600 GMT. KRISTY continued to move on a slightly north of west course, slowly intensifying, and reaching hurricane strength at 100600 GMT with maximum sustained winds estimated at 65 knots. Approaching 140W she began to show signs of weakening and was downgraded to a tropical storm at 110000 GMT.

KRISTY crossed into the Central Pacific Hurricane Center's (CPHC) area as a tropical storm with maximum sustained winds estimated at 55 knots. The CPHC issued its first advisory at 111500 GMT. For reasons unknown, KRISTY accelerated and tumbled across 10 degrees of longitude in the next 24 hours, an average speed of 25 knots (Fig.9), and still maintained moderate tropical storm strength (45-50 knots). When she finally slowed down, KRISTY began to move on a northwesterly track.

Air Force reconnaissance aircraft that flew into JOHN was held in readiness at Hickam AFB, Hawaii to reconoiter KRISTY. Reconnaissance missions were flown into KRISTY's center and around her perimeter on the 12th, 13th, 14th, 15th and 16th.

KRISTY began to show signs on satellite imagery of reintensifying early on August 13. Air Force reconnaissance confirmed this observation and she was upgraded to a hurricane again at 140000 GMT. Turning to a more northerly direction, KRISTY continued to intensify and reached a peak intensity of 80 knots at 141800Z when she was about 250 miles south of South Point, Hawaii. The upper level westerlies began to make its presence felt about this time and her movement slowed to a crawl for the next 18 hours. Early in the morning of the 15th, she began to pick up speed again and move toward the northwest. Her top had been sheared off during the night and a low level circulation appeared to the west of heavy convective clouds. Reconnaissance confirmed what the CPHC forecasters had seen happening during the night and based on their estimates of maximum sustained winds, KRISTY was downgraded to a tropical storm at 151800 GMT. She continued to weaken as she moved toward the west and was downgraded to a tropical depression at 161800Z.

The last advisory by the CPHC was issued at 170300 GMT. A total of 23 advisories were issued by the CPHC. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 10), verify the 24, 48, and 72-hour CPHC forecasts and the forecasts of the EPHC77, EPANLG, and EPCLPR models. All computations were made from the best track positions.

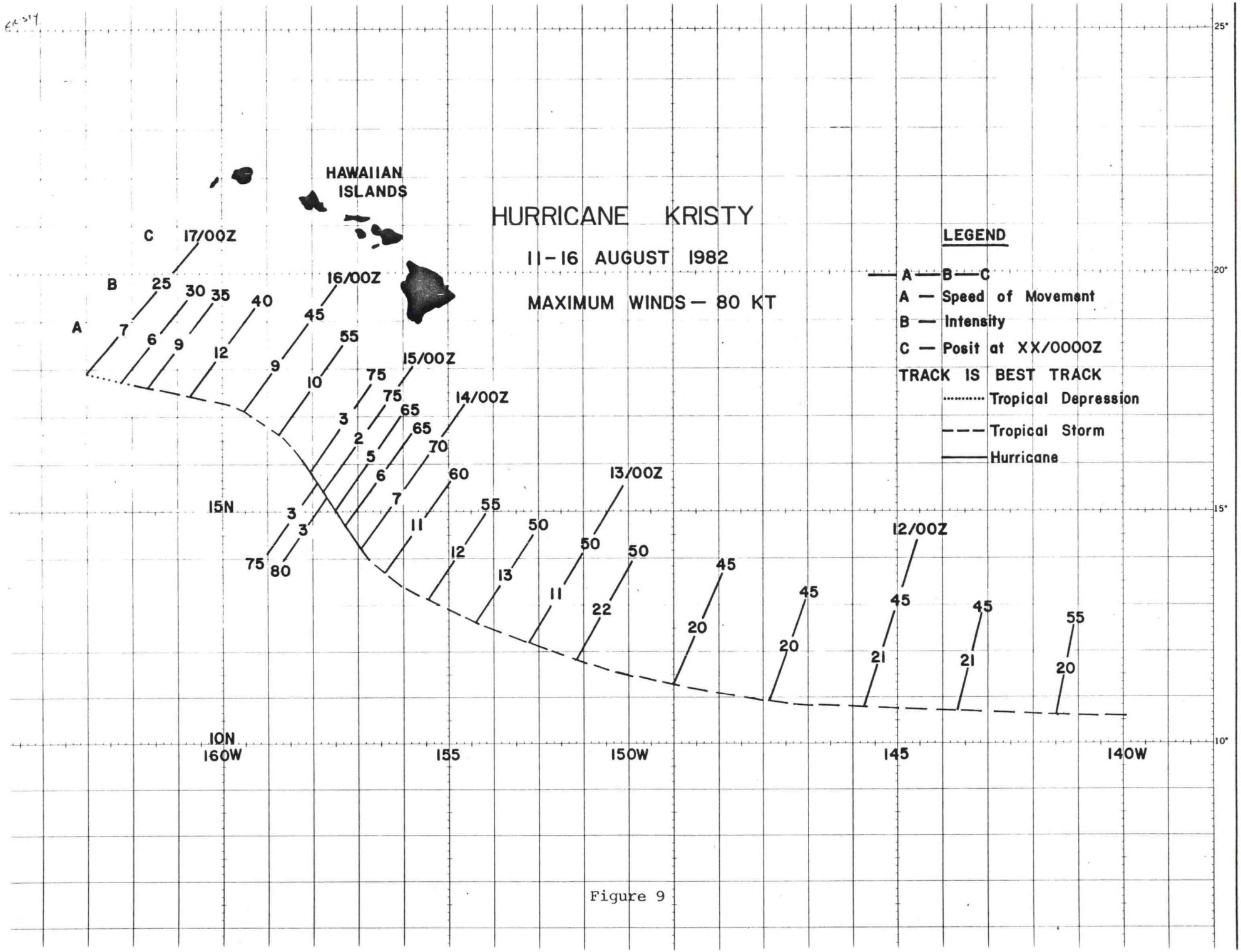
HURRICANE KRISTY
11-16 AUGUST 1982
MAXIMUM WINDS — 80 KT
HAWAIIAN ISLANDS
LEGEND
A — B — C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
Tropical Depression
Tropical Storm
Hurricane
17/00Z
16/00Z
15/00Z
14/00Z
13/00Z
12/00Z
15N
10N
160W
155
150W
145
140W
25°
20°
15°
10°

Figure 9

HURRICANE KRISTY - August 11-16, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
	10.6N	10.7N																					
1112	141.5W	141.5W	6																				
	10.7N	10.7N																					
1118	143.7W	143.4W	18																				
	10.8N	10.7N																					
1200	145.8W	147.5W	102																				
	10.9N	11.0N																					
1206	147.9W	149.3W	84																				
	11.3N	11.2N		10.8N	11.5N	11.4N	11.5N																
1212	150.0W	150.5W	30	146.5W	147.6W	147.4W	147.7W		208	142	153	136											
	11.8N	12.0N		10.9N	12.4N	11.9N	12.4N																
1218	152.2W	151.8W	27	148.8W	149.3W	149.6W	149.6W		207	174	153	157											
	12.2N	12.6N		11.7N	10.9N	M	19.9N																
1300	153.2W	153.2W	24	153.6W	154.9W		155.7W		38	127	-	156											
	12.6N	12.9N		12.1N	11.4N	12.3N	11.4N																
1306	154.4W	154.6W	22	155.3W	155.9W	156.6W	157.4W		61	114	130	190											
	13.2N	13.3N		12.3N	12.5N	12.4N	12.5N							11.3N	12.0N	12.7N	12.2N						
1312	155.4W	155.4W	6	156.5N	156.8W	156.8W	157.4W		84	92	95	124		151.5W	151.6W	152.3W	152.4W		256	234	184	186	
	13.7N	13.6N		13.4N	14.8N	14.2N	14.7N							11.8N	13.0N	13.4N	13.0N						
1318	156.4W	156.5W	8	157.5W	157.2W	157.5W	157.7W		67	81	71	97		153.4W	153.4W	154.7W	153.9W		209	180	101	152	
	14.2N	13.9N		14.2N	14.2N	14.1N	14.1N							12.7N	11.1N	M	11.2N						
1400	157.0W	157.0W	18	159.0W	158.1W	157.7W	158.2W		116	64	41	70		159.6W	157.8W		161.8W		176	192	-	334	
	14.7N	14.5N		14.3N	14.1N	14.4N	14.0N							13.0N	11.6N	13.6N	11.6N						
1406	157.3W	157.7W	26	160.1W	159.4W	159.0W	159.6W		164	127	100	140		161.3W	158.7W	163.1W	162.9W		254	203	344	376	
	15.0N	15.0N		14.6N	14.5N	14.8N	14.4N							13.0N	13.0N	13.9N	12.9N						
1412	157.5W	157.8W	18	160.0W	159.5W	159.5W	159.7W		147	120	117	133		161.5W	160.3W	162.4W	162.4W		262	202	292	312	
	15.3N	15.1N		14.9N	14.9N	15.1N	14.8N							14.6N	15.1N	15.6N	14.6N						
1418	157.7W	157.5W	17	161.3W	160.5W	160.6W	160.5W		210	164	168	165		163.6W	160.5W	162.5W	160.7W		345	163	278	179	
	15.4N	15.5N		15.0N	15.3N	15.3N	15.2N							15.6N	15.4N	1558N	14.8N						
1500	157.8W	157.5W	19	160.8W	160.5W	160.6W	160.4W		175	156	162	151		165.0W	161.2W	161.8W	161.1W		416	197	231	195	
	15.6N	15.8N		15.5N	16.5N	16.0N	16.3N							15.6N	15.3N	15.8N	14.8N						
1506	157.9W	157.5W	26	160.8W	160.5W	160.9W	160.5W		168	159	175	156		165.3W	162.4W	163.1W	162.4W		428	261	301	265	
	15.8N	16.0N		16.6N	17.3N	16.5N	17.2N							15.7N	15.7N	16.2N	15.2N						
1512	158.1W	157.6W	32	159.8W	159.6W	160.5W	159.9W		109	125	145	133		164.6W	162.4W	163.6W	162.3W		375	248	318	246	
	16.6N	16.6N		15.5N	16.8N	16.6N	16.6N							16.0N	16.0N	16.6N	15.6N						
1518	158.7W	158.7W	0	157.8W	157.8W	159.2W	158.1W		84	53	29	35		166.1W	163.3W	164.7W	163.0W		428	267	345	255	
	17.1N	17.2N		16.0N	16.9N	17.0N	16.8N	18.3N						15.8N	16.5N	16.7N	16.0N						
1600	159.5W	159.5W	6	157.5W	157.2W	158.8W	157.5W	158.5W	133	133	41	116	93	164.8W	163.2W	164.3W	162.9W		315	216	277	206	
	17.5N	17.5N		16.2N	18.0N	17.2N	17.9N							16.6N	18.1N	17.4N	17.3N						
1606	160.7W	160.7W	0	157.5W	158.0W	158.6W	158.3W		200	157	122	139		164.0W	162.2W	164.4W	162.3W		197	93	212	93	
	17.6N	17.6N		16.3N	17.9N	17.2N	17.7N	19.5N						18.6N	19.2N	17.9N	18.3N						
1612	161.7W	161.7W	0	157.6W	158.3W	158.9W	158.7W	157.7W	248	195	162	172	251	163.4W	160.4W	163.6W	161.3W		114	121	110	48	
	17.7N	17.7N		17.5N	18.7N	18.0N	18.4N							15.7N	18.5N	17.9N	18.0N						
1618	162.3W	162.3W	0	159.9W	162.1W	160.6W	162.2W		138	61	99	43		157.8W	158.4W	161.7W	159.1W		285	228	36	184	
	17.9N	17.9N		19.0N	M	18.7N	19.4N	20.5N						16.0N	18.6N	18.4N	18.2N						
1700	163.0W	163.0W	0	161.6W		161.8W	163.9W	159.2W	103	-	84	104	266	157.8W	157.6W	161.1W	158.2W		319	311	112	274	

- CPHC Mean Vector Error = 21.3 NM
  Number of cases: 23
- CPHC Mean 24-hr Error = 140.0 NM
  Number of cases: 19
- CPHC Mean 48-hr Error = 267.3 NM
  Number of Cases: 15
- CPHC Mean 72-hr Error = 451.5 NM
  Number of cases: 11

- The vector error is the distance of the initial position from the best track.

EPHC77 Mean 24-hr Error = 124.7 NM (18)*
EPANLG Mean 24-hr Error = 113.7 NM (18)
EPCLPR Mean 24-hr Error = 127.7 NM (19)

EPHC77 Mean 48-hr Error = 207.7 NM (15)
EPANLG Mean 48-hr Error = 224.4 NM (14)
EPCLPR Mean 48-hr Error = 220.3 NM (15)

EPHC77 Mean 72-hr Error = 291.4 NM (11)
EPANLG Mean 72-hr Error = 340.8 NM (10)
EPCLPR Mean 72-hr Error = 360.0 NM (11)

*( ) = Number of cases

72-HOUR FORECAST POSITION					72-HOUR FORECAST ERROR (NM)				
CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
12.3N	12.3N	14.0N	12.6N						
156.5W	155.7W	156.0W	156.5W		172	193	106	155	
12.7N	13.9N	14.7N	13.8N						
159.5W	157.3W	158.2W	158.4W		188	87	46	99	
13.2N	10.3N	M	10.6N						
165.4W	162.3W		165.3W		461	404	-	524	
13.3N	9.9N	14.4N	10.6N						
167.3W	162.8W	167.7W	166.6W		563	446	572	590	
13.0N	12.5N	15.1N	12.1N						
166.5W	164.6W	166.9W	167.8W		516	427	511	607	
16.0N	14.1N	16.9N	13.3N						
169.5W	164.8W	166.8W	167.9W		623	383	466	569	
16.5N	15.4N	16.8N	14.1N						
170.0W	164.7W	165.6W	164.4W		604	316	351	336	
16.6N	14.5N	17.2N	13.5N						
170.3W	165.5W	167.1W	165.2W		553	330	367	354	
16.3N	15.8N	17.5N	14.4N						
169.3W	165.2W	167.4W	165.2W		443	228	326	279	
16.7N	16.5N	17.9N	15.1N						
171.0W	166.4W	168.7W	166.0W		502	246	366	264	
16.6N	17.5N	17.9N	15.9N						
168.8W	165.5N	168.2W	165.4W		341	145	297	183	

Figure 10

TROPICAL STORM AKONI - August 29 - September 2, 1982

The monsoonal trough that extends eastward from the Asian coastline across the tropical western Pacific has been very persistent through the summer of 1982. In late August the trough worked its way east of the International Date Line. It was during this period that T.D. 1C came into being near 11.0N 169.0W. The Central Pacific Hurricane Center (CPHC) issued its first advisory on T.D. 1C at 300900 GMT. Moving slowly westward, T.D. 1C intensified rapidly and was named Tropical Storm AKONI at 301800Z. AKONI moved slowly westward and had maximum sustained winds estimated at 45 knots using satellite imagery and Dvorak's technique.

At 010000 GMT, the ocean-going tug MANA HOLO reported its position as 14 deg 08 min North 174 deg 44 min West and experiencing heavy rainshowers with an east northeast wind of 10 to 15 knots and 8 to 10-foot swell. The tug's barometer read 29.65 inches or 1004.1 millibars. The tug was very near the center of AKONI whose position as determined from satellite imagery was near 14.0N 174.0W at the same time.

Maximum sustained winds estimated from satellite imagery corresponded very well with the maximum sustained wind derived by using the tug's pressure to approximate the central pressure of the storm. This was confirmed at 010515 GMT when the MANA HOLO reported east northeast winds of 50 knots gusting to 60 knots and 20-foot swell several miles east of its last reported position. During the next 12 hours, AKONI became quasi-stationary (Fig. 11) and began to feel the effects of the upper level trough northwest of the center. He was downgraded to a tropical depression at 020000Z as the remnant low level circulation continued westward in the easterlies.

The final bulletin on T.D. AKONI was issued by the CPHC at 021500 GMT. A total of 14 advisories was issued by the CPHC. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 12) verify the 24- and 48-hour CPHC forecasts and the forecasts by the EPHC77, EPANLG, and EPCLPR models. All computations were made from the best track positions.

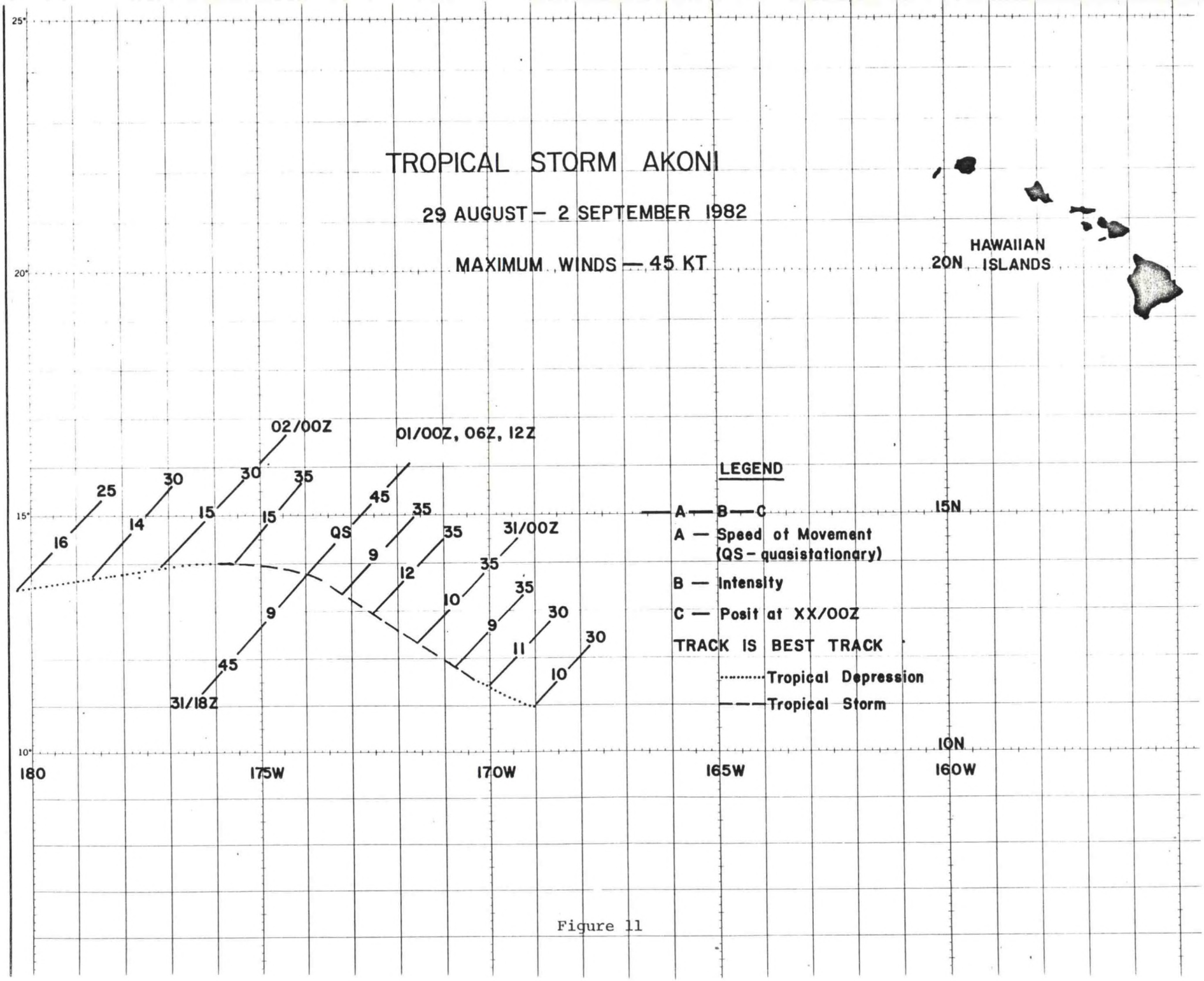
TROPICAL STORM AKONI
29 AUGUST – 2 SEPTEMBER 1982
MAXIMUM WINDS — 45 KT
HAWAIIAN ISLANDS
20N
15N
10N
25°
20°
15°
10°
180
175W
170W
165W
160W
02/00Z
01/00Z, 06Z, 12Z
31/00Z
31/18Z
25
16
30
14
30
15
35
15
45
QS
35
9
35
12
35
10
35
9
30
11
30
10
45
9
LEGEND
A — B — C
A — Speed of Movement (QS – quasistationary)
B — Intensity
C — Posit at XX/00Z
TRACK IS BEST TRACK
Tropical Depression
Tropical Storm

Figure 11

TROPICAL STORM AKONI - August 29-September 2, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
	11.0N	11.0N																					
3006	169.0W	169.0W	0																				
	11.4N	11.0N																					
3012	170.0W	170.0W	24																				
	11.8N	11.2N																					
3018	170.7W	170.3W	38																				
	12.4N	12.4N																					
3100	171.5W	171.5W	0																				
	13.0N	12.7N		11.0N	11.9N	12.1N	11.9N																
3106	172.5W	172.5W	18	173.0W	173.2W	173.3W	173.4W		123	77	71	84											
	13.4N	13.0N		11.0N	12.0N	12.1N	12.0N																
3112	173.2W	173.4W	25	174.0W	174.2W	174.2W	174.4W		151	102	97	109											
	13.8N	14.0N		11.5N	13.0N	12.2N	12.9N																
3118	174.0W	174.0W	12	173.1W	173.5W	173.4W	173.2W		147	56	102	71											
	13.8N	14.0N		13.3N	14.5N	13.8N	14.4N																
0100	174.0W	174.0W	12	175.5W	175.0W	175.2W	175.0W		92	71	69	68											
	13.8N	13.5N		13.4N	14.6N	14.1N	14.6N							11.0N	12.7N	13.5N	12.9N						
0106	174.0W	174.0W	18	176.5W	176.4W	176.3W	176.3W		147	147	135	142		177.0W	176.2W	177.8W	176.0W		243	144	222	128	
	13.8N	13.8N		13.4N	15.2N	14.6N	15.2N							11.0N	12.9N	13.6N	12.9N						
0112	174.0W	173.8W	12	177.4W	177.2W	177.1W	177.1W		199	203	186	198		178.0W	177.1W	178.7W	177.0W		288	188	274	183	
	14.0N	14.0N		15.5N	16.6N	15.8N	17.0N							11.9N	14.1N	13.7N	14.1N						
0118	175.6W	175.6W	0	177.8W	177.4W	177.0W	177.2W		156	187	135	202		177.1W	175.3W	176.9W	175.0W		153	18	77	35	
	13.9N	14.0N		14.0N	15.7N	15.4N	15.8N							13.4N	15.8N	15.3N	15.9N						
0200	177.2W	177.2W	6	174.0W	175.9W	176.2W	175.8W		186	131	107	139		179.6W	176.4W	179.1W	176.1W		143	123	138	135	
	13.7N	13.7N		13.7N	15.0N	14.8N	15.1N							13.5N	15.8N	15.4N	16.0N						
0206	178.7W	178.7W	0	174.6W	174.8W	176.3W	174.9W		239	239	154	236		179.4E	178.6W	178.8E	178.0W		111	126	177	143	
	13.5N	13.5N		14.0N	13.6N	13.6N	13.7N							13.5N	16.4N	16.0N	16.7N						
0212	179.8E	179.8E	0	174.9W	174.1W	175.4W	174.3W		310	355	280	344		178.6E	179.0W	178.3E	178.5W		70	187	173	215	

Date/Time	72-HOUR FORECAST POSITION					72-HOUR FORECAST ERROR (NM)				
0206	11.0N 179.0W	12.0N 177.5W	14.9N 178.9W	11.8N 176.6W		163	123	72	167	
0212	11.0N 178.0E	12.4N 178.3W	14.9N 178.0E	11.8N 177.5W		183	129	134	188	

* CPHC Mean Vector Error = 11.8 NM
Number of cases: 14

CPHC Mean 24-hr Error = 175.0 NM
Number of cases: 10

CPHC Mean 48-hr Error = 168.0 NM
Number of cases: 6

* The vector error is the distance of the initial position from the best track

EPHC77 Mean 24-hr Error = 156.8 NM
EPANLG Mean 24-hr Error = 133.6 NM
EPCLPR Mean 24-hr Error = 159.3 NM
Number of cases: 10

EPHC77 Mean 48-hr Error = 131.0 NM
EPANLG Mean 48-hr Error = 176.8 NM
EPCLPR Mean 48-hr Error = 139.8 NM
Number of cases: 6

Figure 12

TROPICAL STORM MIRIAM - September 4-6, 1982

MIRIAM came to life as T.D. 19E on August 29, 1982 near 12.5N 108.5W. The Eastern Pacific Hurricane Center issued its first bulletin on T.D. 19E at 300300 GMT. The depression moved in a west northwest direction, intensified into a tropical storm and was named MIRIAM at 301800 GMT. Continuing on a west northwest course she intensified rapidly and was upgraded to a hurricane at 311800 GMT. MIRIAM reached an estimated peak intensity of 75 knots at 021200 GMT and remained steady state until 040000 GMT when she started to weaken. MIRIAM approached 140W under the cover of darkness. Satellite fixes, using an area of convection to the south of the actual center, had the storm moving on a slightly south of west course. She was passed to the Central Pacific Hurricane Center (CPHC) at 041500 GMT.

The CPHC issued its first bulletin on MIRIAM at 042100 GMT. Using visual satellite imagery, the forecasters had to relocate the storm further north from her last estimated position. In actuality, MIRIAM had continued to move on a west northwest course instead of a course to the west. Her low level circulation had been separated from the convection on the south side of her center. She was reacting to a mid latitude upper level trough that was digging southward and the resultant surface low that developed to the north of her center. MIRIAM's course changed to one toward the northwest and by 051800 GMT had veered further and was just slightly west of north. During this period she had weakened considerably and was downgraded to a tropical depression at 051200 GMT. She moved in an S-wave pattern toward the north and became an extra-tropical system (Fig. 13).

The CPHC issued its final advisory on T.D. MIRIAM at 062100 GMT. Nine advisories were issued by the CPHC. There were no reports of damages or casualties to ships.

Verification statistics (Fig. 14) verify the 24-hour CPHC forecast and forecasts by the EPHC77, EPANLG, and EPCLPR models. Statistical computations on the MFM and 48-hour forecasts were not made due to an insufficient number of cases. All computes were made from the best track position.

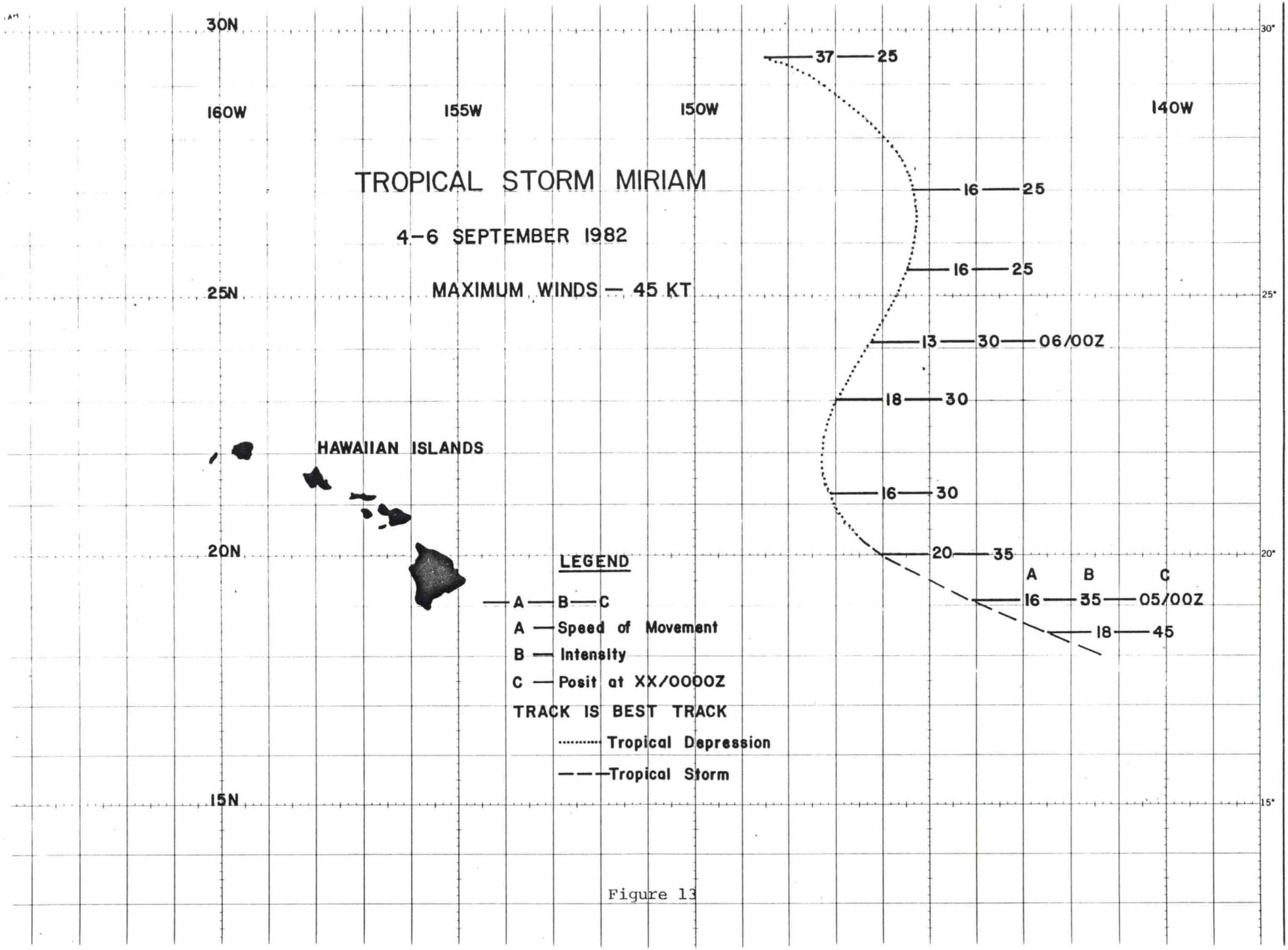
30N
160W
155W
150W
140W
TROPICAL STORM MIRIAM
4-6 SEPTEMBER 1982
MAXIMUM WINDS — 45 KT
25N
HAWAIIAN ISLANDS
20N
15N
37 — 25
16 — 25
16 — 25
13 — 30 — 06/00Z
18 — 30
16 — 30
20 — 35
A B C
16 — 35 — 05/00Z
18 — 45
LEGEND
— A — B — C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
..... Tropical Depression
— — — Tropical Storm

Figure 13

TROPICAL STORM MIRIAM - September 4-6, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
0418	18.5N 142.5W	18.5N 142.5W	0																				
0500	19.1N 144.2W	19.1N 144.2W	0																				
0506	20.0N 146.0W	19.7N 145.9W	19																				
0512	21.2N 147.1W	20.8N 147.1W	24																				
0518	23.0N 147.0W	23.0N 147.0W	0	20.7N 149.0W	19.4N 146.6W	19.9N 147.8W	19.4N 148.6W		177	217	191	233												
0600	24.1N 146.3W	24.5N 146.0W	29	21.1N 150.8W	20.7N 147.8W	20.7N 149.6W	20.5N 150.1W	22.7N 144.9W	307	220	274	301	114											
0606	25.5N 145.5W	25.5N 145.5W	0	21.5N 152.5W	22.1N 149.7W	20.9N 151.2W	21.5N 151.8W		453	307	418	421												
0612	27.0N 145.4W	27.0N 144.5W	48	24.5N 152.1W	23.1N 150.7W	22.5N 151.6W	21.9N 152.5W		391	371	432	493												
0618	29.5N 148.5W	29.5N 148.5W	0	30.0N 143.2W	26.8N 146.8W	26.6N 149.9W	26.2N 148.9W		277	185	189	199		22.1N 155.2W	20.7N 147.6W	21.1N 152.0W	20.4N 152.6W		572	530	542	538	

* CPHC Mean Vector Error = 13.3 NM
Number of cases: 9

CPHC Mean 24-hr Error = 321 NM
Number of cases: 5

EPHC77 Mean 24-hr Error = 260 NM
EPANLG Mean 24-hr Error = 300.8 NM
EPCLPR Mean 24-hr Error = 329.4 NM
Number of cases: 5

* The vector error is the distance of the initial position from the best track

Figure 14

TROPICAL STORM EMA - September 15-18, 1982

EMA began in an area of convection near 15N 140W. The forecasters at the Central Pacific Hurricane Center watched the area for several days until satellite imagery on September 15 confirmed that a tropical depression had formed. The CPHC issued its first advisory on T.D. 2C at 152100 GMT and centered the system near 15.5N 142.5W. Intensifying as it moved slowly north northeast, the tropical depression was upgraded to a tropical storm and named EMA at 160000 GMT. Between 161200 and 171200 GMT, EMA became quasi-stationary and drifted around a small area near 16.8N 142.0W, probably going through several small trochoidal loops, before she decided to resume her trek toward the north northeast (Fig. 15). EMA remained a tropical storm for another 24 hours and was downgraded to a tropical depression at 181800 GMT.

EMA's movement toward the north northeast was influenced by the surface trough that developed west of the Oregon-California coast under a 500 MB low that dug southwestward from a position over the Pacific Northwest. There were also several short wave troughs at higher levels that scooted rapidly by to the north of EMA that caused her to weaken and move toward the northeast.

During her entire life span, position and intensity estimates were made from satellite. Maximum sustained winds at EMA's peak were estimated to be 40 knots using the Dvorak technique.

The last advisory issued by the CPHC was issued at 190300 GMT when the remains of T.D. EMA were just east of 140W. Coordination with the Eastern Pacific Hurricane Center resulted in putting T.D. EMA to rest. The CPHC issued 14 advisories on EMA. There were no reports of damages or casualties to ships.

Verification statistics in Fig. 16 verify the 24- and 48-hour CPHC forecasts and the forecasts from the EPHC77, EPANLG, and EPCLPR models. Statistical computations on the 72-hour forecasts were not made due to an insufficient number of cases. All computes were made from the best track positions.

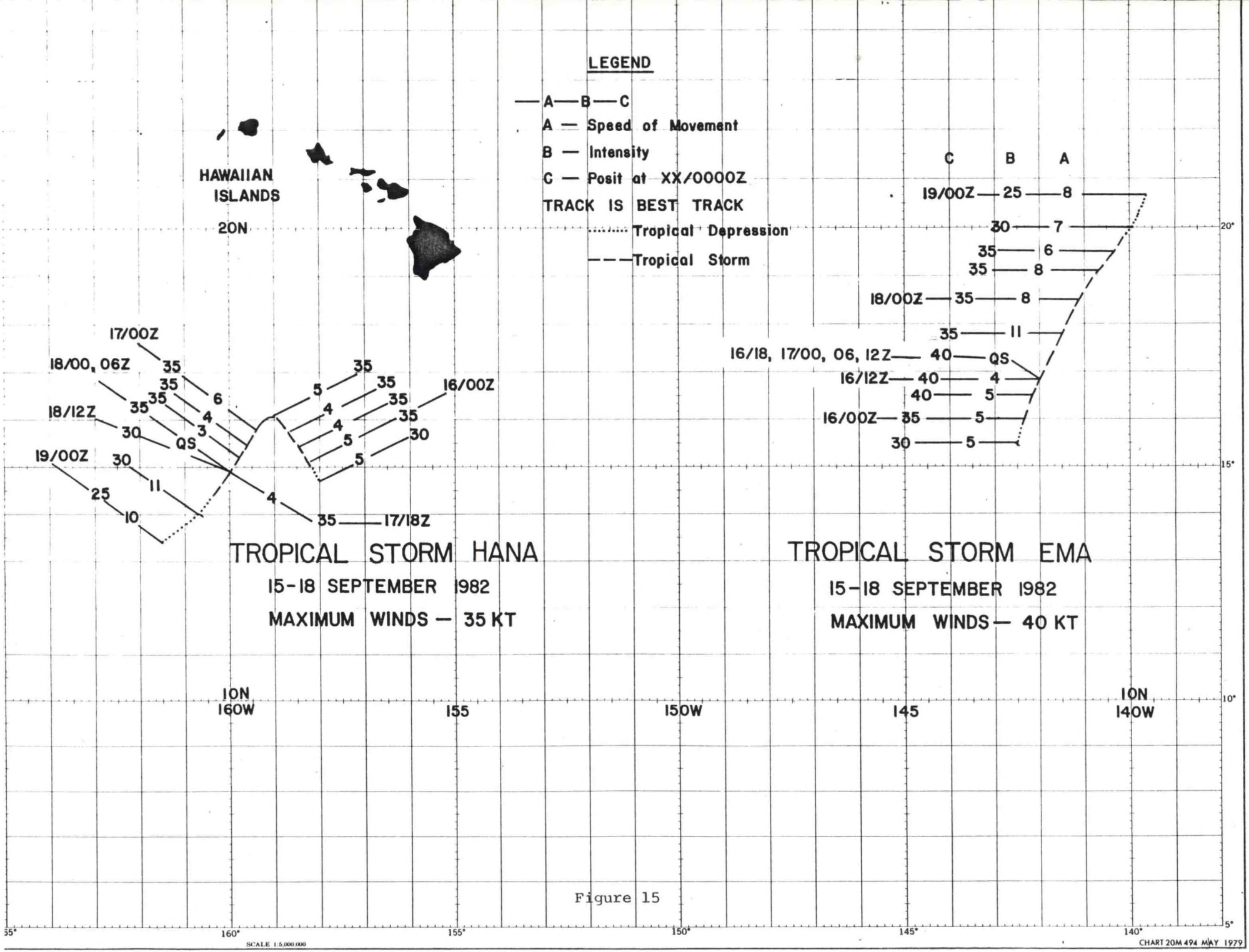
LEGEND
—A—B—C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
Tropical Depression
Tropical Storm
HAWAIIAN ISLANDS
20N
17/00Z
18/00, 06Z
18/12Z
19/00Z
16/00Z
17/18Z
TROPICAL STORM HANA
15-18 SEPTEMBER 1982
MAXIMUM WINDS — 35 KT
C B A
19/00Z — 25 — 8
30 — 7
35 — 6
35 — 8
18/00Z — 35 — 8
35 — 11
16/18, 17/00, 06, 12Z — 40 — QS
16/12Z — 40 — 4
40 — 5
16/00Z — 35 — 5
30 — 5
TROPICAL STORM EMA
15-18 SEPTEMBER 1982
MAXIMUM WINDS — 40 KT
10N
160W
155
150W
145
10N
140W
20°
15°
10°
5°
55°
160°
155°
150°
145°
140°
SCALE 1:5,000,000
CHART 20M 494 MAY 1979

Figure 15

TROPICAL STORM EMA - September 15-18, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
1518	15.5N 142.5W	15.5N 142.5W	0																				
1600	16.0N 142.3W	16.0N 142.3W	0																				
1606	16.5N 142.2W	16.5N 142.2W	0																				
1612	16.8N 142.0W	16.8N 142.0W	0																				
1618	16.8N 142.0W	16.8N 142.0W	0	18.0N 142.0W	17.7N 141.9W	17.0N 143.9W	17.6N 141.8W		72	54	109	49												
1700	16.8N 142.0W	16.8N 142.0W	0	18.0N 141.7W	18.4N 141.8W	17.8N 142.0W	18.3N 141.7W		74	96	60	91												
1706	16.8N 142.0W	16.6N 142.0W	12	18.5N 141.8W	19.0N 142.0W	18.2N 143.5W	18.8N 141.9W		102	132	120	120												
1712	16.8N 142.0W	16.8N 142.0W	0	18.7N 141.9W	19.0N 141.7W	18.3N 143.1W	18.8N 141.9W		114	133	109	120												
1718	17.8N 141.5W	17.8N 1.5W	0	18.0N 143.0W	17.9N 141.7W	18.1N 142.9W	17.8N 142.1W		86	13	81	34		20.3N 142.8W	20.2N 141.8W	18.3N 145.9W	19.6N 141.7W		167	145	252	108	
1800	18.5N 141.2W	18.8N 141.5W	25	18.0N 143.0W	17.4N 142.0W	17.9N 143.0W	17.2N 142.5W		106	80	108	107		20.9N 143.2W	21.2N 141.5W	19.3N 142.6W	20.4N 141.8W		183	162	92	118	
1806	19.1N 140.7W	19.8N 141.5W	61	18.5N 144.0W	17.0N 142.1W	17.4N 143.2W	16.7N 142.6W		190	149	175	180		20.5N 142.6W	21.9N 141.9W	19.6N 145.5W	21.0N 142.3W		136	181	273	145	
1812	19.5N 140.3W	19.4N 141.0W	40	17.9N 143.0W	17.6N 142.0W	17.6N 143.2W	17.3N 142.6W		181	149	200	185		20.4N 142.7W	21.7N 141.7W	19.5N 145.0W	20.8N 142.5W		145	153	265	146	
1818	20.0N 140.0W	20.0N 140.0W	0	20.3N 142.0W	20.5N 140.5W	18.9N 142.1W	20.0N 140.7W		114	41	135	39		19.0N 145.0W	19.5N 142.1W	19.2N 144.7W	19.1N 143.3W		289	122	269	194	
1900	20.7N 139.6W	20.7N 139.6W	0	22.4N 143.3W	22.1N 140.4W	20.5N 142.3W	21.6N 141.3W		230	95	152	109		19.0N 145.0W	18.4N 142.8W	19.0N 144.9W	18.0N 144.2W		321	227	316	306	

* CPHC Mean Vector Error = 9.9 NM
  Number of cases: 14

CPHC Mean 24-hr Error = 126.9 NM
  Number of cases: 10

CPHC Mean 48-hr Error = 206.8 NM
  Number of cases: 6

* The vector error is the distance of the initial position from the best track

EPHC77 Mean 24-hr Error = 94.2 NM
EPANLG Mean 24-hr Error = 124.9 NM
EPCLPR Mean 24-hr Error = 103.4 NM
  Number of cases: 10

EPHC77 Mean 48-hr Error = 165.0 NM
EPANLG Mean 48-hr Error = 244.5 NM
EPCLPR Mean 48-hr Error = 169.5 NM
  Number of cases: 6

Figure 16

TROPICAL STORM HANA - September 15-18, 1982

HANA started in similar fashion as EMA over the same time period. The forecasters at the Central Pacific Hurricane Center (CPHC) kept watch on an area of convection to the south of the Hawaiian Islands for several days. Satellite imagery on September 15 indicated that the mass of convection had become organized during the night and the CPHC issued its first advisory on T.D. 3C centered near 14.7N 158.0W at 152100 GMT. T.D. 3C intensified rapidly and was upgraded to a tropical storm named HANA at 160000Z.

HANA moved on a steady course toward the north northwest for 24 hours. Her low level circulation during her entire life cycle as a tropical storm was obscured by high clouds and convection. All position and intensity estimates on HANA were made from satellite imagery using the Dvorak technique. Fixes at 170000, 170600, and 171200 GMT were suspect because the low level circulation was not discernible. Low cloud banding seen in satellite imagery used to make the 171800 GMT fix indicated that the center of the storm was approximately 100 miles south and east of the 0600 and 1200 GMT positions, so the system was relocated to a position near 14.9N 160.0W (Fig. 15) at 171800 GMT. HANA remained quasi-stationary for the next 18 hours and probably went through a trochoidal loop before exiting and moving on a course toward the southwest. A very weak low level circulation made its appearance at this time and HANA was downgraded to a tropical depression.

The final advisory on HANA was issued at 190300 GMT. A total of 14 advisories were issued by the CPHC. There were no reports of damages or casualties to ships.

Verification statistics in Fig. 17 verify the 24- and 48-hour CPHC forecasts and the forecasts from the EPHC77, EPANLG, and EPCLPR models. Statistical computations on the 72-hour forecasts were not made due to an insufficient number of cases. All computes were made from the best track positions.

TROPICAL STORM HANA - September 15-18, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM
1518	14.7N 158.0W	14.7N 158.0W	0																				
1600	15.1N 158.3W	15.1N 158.2W	6																				
1606	15.4N 158.4W	15.4N 158.4W	0																				
1612	15.7N 158.7W	15.6N 158.8W	8																				
1618	16.1N 159.0W	16.1N 159.0W	0	16.5N 159.4W	17.1N 158.8W	16.4N 15 .8W	17.0N 159.0W		33	61	49	54												
1700	15.8N 159.4W	16.3N 160.0W	45	16.6N 159.5W	16.7N 158.8W	16.8N 160.1W	16.6N 159.0W		48	64	72	53												
1706	15.5N 159.6W	16.5N 160.5W	79	16.9N 159.9W	16.8N 159.0W	16.8N 159.7W	16.8N 159.0W		85	85	78	85												
1712	15.3N 159.8W	16.5N 160.5W	82	17.1N 160.1W	17.2N 160.0W	16.8N 160.5W	17.2N 160.3W		109	114	98	117												
1718	14.9N 160.0W	14.9N 160.0W	0	17.5N 160.5W	18.0N 160.1W	17.5N 160.5W	17.9N 160.5W		158	186	158	182	17.8N 161.9W	19.7N 159.0W	17.9N 162.0W	19.2N 159.3W			205	293	213	261	
1800	14.9N 160.0W	14.6N 159.5W	34	17.4N 162.2W	18.1N 162.0W	17.7N 162.4W	18.1N 162.6W		196	223	217	243	18.6N 162.0W	18.9N 159.1W	18.3N 162.4W	18.4N 159.5W			249	245	246	212	
1806	14.9N 160.0W	14.9N 160.0W	0	17.7N 163.2W	17.6N 163.4W	17.7N 162.7W	17.6N 163.7W		249	254	228	267	19.0N 162.5W	18.9N 159.7W	18.1N 161.2W	18.5N 159.4W			284	240	204	218	
1812	14.9N 160.0W	14.9N 160.0W	0	17.3N 162.3W	17.1N 161.4W	17.4N 162.1W	17.1N 162.0W		195	154	192	175	18.6N 162.0W	19.1N 161.0W	18.0N 162.3W	18.7N 161.6W			249	258	228	245	
1818	14.0N 160.7W	14.0N 160.7W	0	15.0N 161.0W	16.4N 159.9W	16.5N 161.1W	16.3N 160.5W		62	151	151	138	18.9N 162.5W	20.1N 160.7W	18.7N 162.6W	19.6N 161.8W			311	366	302	341	
1900	13.4N 161.5W	13.4N 161.5W	0	15.0N 161.0W	16.0N 159.9W	15.9N 161.6W	15.9N 160.4W		100	181	150	163	18.0N 164.4W	19.9N 163.8W	18.9N 164.7W	19.5N 164.5W			322	411	377	404	

* CPHC Mean Vector Error = 18.1 NM
Number of cases: 14

CPHC Mean 24-hr Error = 123.5 NM
Number of cases: 10

CPHC Mean 48-hr Error = 270.0 NM
Number of cases: 6

EPHC77 Mean 24-hr Error = 147.3 NM
EPANLG Mean 24-hr Error = 139.3 NM
EPCLPR Mean 24-hr Error = 147.7 NM
Number of cases: 10

EPHC77 Mean 48-hr Error = 302.2 NM
EPANLG Mean 48-hr Error = 261.7 NM
EPCLPR Mean 48-hr Error = 280.2 NM
Number of cases: 6

* The vector error is the distance of the initial position from the best track

Figure 17

HURRICANE IWA - November 19-24, 1982

Tropical cyclones reaching storm intensity between 140W and the dateline were given Hawaiian names for the first time in the 1982 tropical cyclone season. IWA was the fourth tropical storm thus named in 1982.

A very active near-equatorial trough was present during mid-November to the south of the Hawaiian Islands with westerly surface winds and widespread convective activity along this trough that lay across the entire central Pacific from about 140E to 140W. An organized area of cyclonic circulation could be noted near 7N 163W at 180000 GMT moving westward slowly and was being carried on the WSFO Honolulu marine forecasts as a tropical disturbance. At 191200 GMT, satellite imagery indicated further development and the CPHC issued the first advisory on Tropical Storm IWA. Over the next several days, Tropical Storm IWA drifted slowly in a generally northerly direction gradually gaining strength, and at 230000 GMT it attained hurricane intensity near 16N 164W or about 500 miles southwest of Honolulu (Fig. 18).

Hurricane IWA, which on the previous day or two, had moved north northwest at 3 to 5 knots, gradually gained forward speed on the 23rd and slowly intensified over the warm waters while turning to a more northerly and later northeasterly course.

An Air Force reconnaissance plane flew into the center of IWA at 231800 GMT and measured surface winds of 80 knots and a minimum sea level pressure of 968 millibars near 20.2N 162.7W. The 80 knot winds were in good agreement with the 75 knot winds carried in the CPHC advisory 6 hours earlier based on satellite imagery. A subsequent fix at 232100 GMT near 20.7N 162.4W, or 250 miles southwest of Honolulu confirmed 80 knot sustained winds, while a fix 3 hours later at 240000 GMT near 21.6N 161.6W estimated winds down slightly to 70 knots. IWA was now moving rapidly northeastward at about 20-25 knots.

Hurricane IWA had peaked with respect to intensity, but the rapidly accelerating forward motion made winds and swell conditions within the dangerous right semicircle over Kauai very severe. Moving northeastward just north of Kauai between 240300 GMT at 22.4N 160.1W and 23.3N 158.5W at 240600 GMT, Hurricane IWA was moving at a forward speed of 25-30 knots and producing rapidly changing conditions over the Hawaiian Islands with a quick deterioration and a subsequent very rapid improvement as the hurricane center swept out to the northeast. At 250000 GMT, the center was already 350 miles northeast of Honolulu near 26.5N 151.7W with winds rapidly weakening. Issuance of tropical cyclone advisories was subsequently discontinued and the remnant circulation was carried as a gale low on the marine bulletins issued by WSFO's Honolulu and San Francisco.

The CPHC issued 23 advisories on IWA. Although property damage was severe on Kauai, most physical injuries to people were minor and only one death occurred. A seaman aboard a Navy destroyer leaving Pearl Harbor ahead of the storm was killed by heavy seas which dashed him against a stanchion. Another life was lost in the aftermath of the storm during cleanup operations.

Verification statistics (Fig. 19) verify the 24, 48, and 72-hour CPHC forecasts and the forecasts from the EPHC77, EPANLG, EPCLPR, and MFM models. All computes were made from the best track positions.

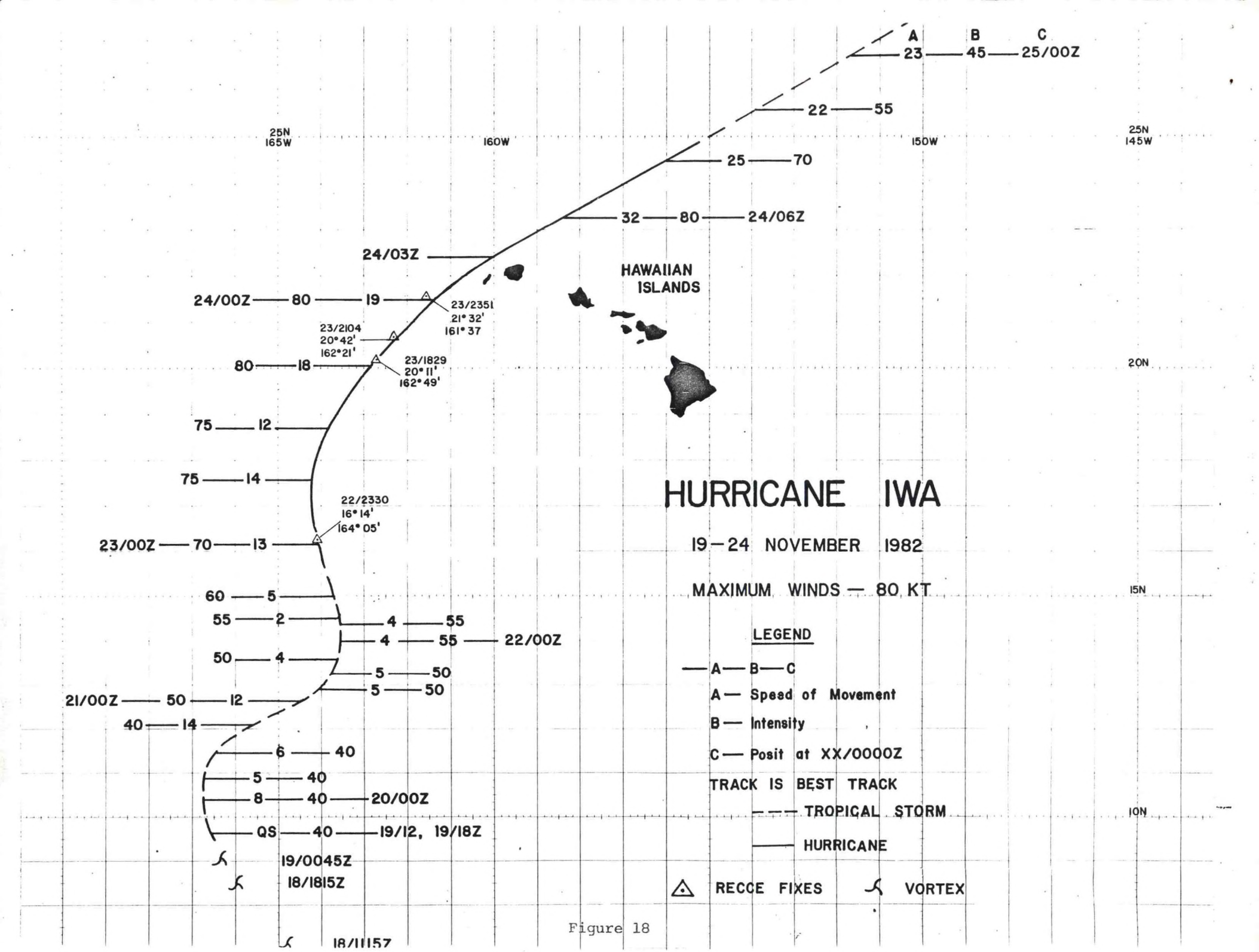
A B C
23 — 45 — 25/00Z
22 — 55
25N 165W
160W
150W
25N 145W
25 — 70
32 — 80 — 24/06Z
24/03Z
HAWAIIAN ISLANDS
24/00Z — 80 — 19
23/2351 21° 32' 161° 37
23/2104 20° 42' 162° 21'
80 — 18
23/1829 20° 11' 162° 49'
20N
75 — 12
75 — 14
22/2330 16° 14' 164° 05'
23/00Z — 70 — 13
60 — 5
55 — 2 — 4 — 55
4 — 55 — 22/00Z
50 — 4
5 — 50
5 — 50
21/00Z — 50 — 12
40 — 14
6 — 40
5 — 40
8 — 40 — 20/00Z
QS — 40 — 19/12, 19/18Z
19/0045Z
18/1815Z
18/1115Z
15N
10N
HURRICANE IWA
19 — 24 NOVEMBER 1982
MAXIMUM WINDS — 80 KT
LEGEND
— A — B — C
A — Speed of Movement
B — Intensity
C — Posit at XX/0000Z
TRACK IS BEST TRACK
- - - - TROPICAL STORM
—— HURRICANE
RECCE FIXES
VORTEX

Figure 18

HURRICANE IWA November 19-24, 1982

Date/ Time (GMT)	Best Track Lat/ Long	Actual Track Lat/ Long	Error (NM)	24-HOUR FORECAST POSITION					24-HOUR FORECAST ERROR (NM)					48-HOUR FORECAST POSITION					48-HOUR FORECAST ERROR (NM)					72-HOUR FORECAST POSITION					72-HOUR FORECAST ERROR (NM)				
				CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM	CPHC Lat/ Long	EPHC77	EPANLG	EPCLPR	MFM
1912	9.7N 166.6W	10.8N 167.1W	72																													
1918	9.7N 166.6W	9.7N 167.0W	24																													
2000	10.9N 166.8W	9.7N 167.0W	73																													
2006	10.8N 166.6W	9.7N 167.0W	70																													
2012	11.4N 166.5W	9.7N 167.0W	106	12.9N 170.4W	14.7N 165.8W	M	14.7N 165.3W		246	202	-	210																				
2018	12.1N 165.6W	11.8N 166.5W	56	9.8N 167.0W	12.1N 164.9W	11.0N 166.9W	11.9N 164.8W		161	41	101	49																				
2100	12.7N 164.5W	12.7N 165.0W	30	10.0N 167.5W	12.0N 164.8W	10.7N 167.2W	11.8N 164.5W		240	46	199	54																				
2106	12.9N 164.0W	13.0N 164.8W	47	10.0N 167.5W	12.6N 164.8W	10.7N 166.9W	12.3N 164.5W		269	50	215	47																				
2112	13.3N 163.8W	13.0N 164.8W	61	10.0N 167.5W	12.8N 164.8W	10.6N 166.9W	12.5N 164.6W		294	66	244	67		14.8N 173.3W	16.9N 170.4W	M	18.8N 158.0W		560	439	-	470											
2118	13.6N 163.6W	13.0N 164.4W	59	12.6N 166.4W	16.2N 164.3W	13.5N 167.9W	15.9N 164.0W		174	161	251	140		10.0N 167.5W	16.6N 164.0W	12.8N 168.4W	15.4N 160.7W		315	182	284	200											
2200	14.0N 163.6W	13.7N 163.7W	19	14.7N 163.6W	17.6N 162.3W	15.2N 167.4W	17.4N 160.5W	13.8N 165.5W	142	229	260	271	111	10.3N 168.0W	16.8N 164.0W	12.2N 169.3W	15.5N 160.7W		340	170	350	191	-										
2206	14.4N 163.5W	14.4N 163.6W	7	15.0N 163.4W	17.9N 162.6W	M	18.1N 159.5W		37	216	-	320	-	10.3N 16810W	18.2N 163.9W	12.2N 168.8W	16.4N 160.5W		361	229	336	211											
2212	14.5N 163.6W	14.5N 163.5W	7	14.7N 163.6W	15.7N 162.2W	14.1N 167.0W	15.4N 162.3W	13.9N 165.6W	13	108	199	93	122	10.5N 168.5W	18.8N 163.7W	12.2N 167.2W	16.8N 160.5W		374	258	251	226		16.8N 176.2W	20.2N 176.3W	M	18.9N 15216W		741	803	-	685	
2218	15.0N 163.7W	15.0N 163.5W	14	14.0N 164.0W	14.7N 161.7W	13.6N 165.3W	14.5N 161.8W		63	117	125	114	-	13.5N 166.3W	20.7N 164.0W	15.2N 171.9W	20.9N 158.7W		176	342	475	455		10.3N 168.0W	20.3N 179.5W	14.4N 171.3W	17.8N 153.7W		378	957	443	559	
2300	16.2N 164.0W	16.2N 164.1W	7	15.5N 162.8W	17.0N 160.6W	15.0N 165.5W	16.6N 161.3W	15.6N 163.9W	81	201	113	157	37	16.7N 162.3W	21.3N 163.7W	16.9N 177.0W	23.1N 153.8W		102	307	749	709		10.5N 168.5W	22.5N 177.4E	13.9N 172.8W	19.0N 152.4W		431	1118	528	684	
2306	17.6N 164.2W	17.6N 164.2W	0	16.3N 162.5W	18.8N 159.3W	16.7N 164.6W	18.8N 159.8W		125	288	59	261	-	17.0N 162.0W	19.2N 166.9W	M	24.3N 152.0W		131	181	-	792	-	10.5N 168.5W	25.4N 175.8E	13.9N 172.2W	20.3N 151.6W		494	1209	512	733	
2312	18.7N 163.8W	18.7N 163.7W	7	16.0N 162.3W	17.6N 176.0W	16.0N 163.7W	17.3N 161.0W	17.7N 164.8W	183	699	162	181	83	16.4N 162.4W	21.3N 160.3W	15.4N 168.8W	19.6N 159.1W	15.4N 168.2W	160	252	348	272	321	10.8N 169.5W	26.8N 175.8E	13.8N 171.8W	21.0N 151.2W		578	1227	546	724	
2318	20.1N 162.9W	20.1N 162.9W	0	16.0N 162.3W	16.9N 160.0W	16.0N 164.9W	16.7N 161.1W		248	253	271	228	-	16.0N 162.7W	19.1N 159.6W	14.8N 165.7W	18.1N 159.1W		246	196	356	247	-	14.5N 166.2W	28.1N 174.4W	16.1N 170.9W	23.5N 151.1W		386	791	515	688	
2400	21.5N 161.4W	21.5N 161.5W	7	18.1N 163.3W	M	18.0N 165.2W	20.2N 163.4W	19.5N 163.2W	231	-	300	137	157	18.0N 161.5W	22.2N 157.9W	16.3N 166.9W	20.5N 157.7W	17.9N 165.5W	210	199	441	216	317	18.8N 160.6W	34.1N 176.8W	16.1N 165.1W	27.2N 144.9W		168	1111	386	964	
2406	23.3N 158.4W	23.0N 158.5W	19	20.5N 161.4W	22.4N 149.0W	20.0N 165.1W	22.7N 163.4W		237	522	423	279	-	18.3N 160.8W	21.7N 156.9W	18.8N 166.3W	22.6N 154.3W		329	127	518	230	-	19.0N 160.6W	35.4N 178.0E	M	29.0N 42.2W		286	1426	-	936	
2412	29.5N 156.0W	24.5N 156.2W	14	21.1N 160.4W	23.2N 145.6W	21.7N 164.7W	23.0N 161.2W	24.3N 159.8W	318	576	509	299	208	17.7N 161.0W	22.4N 157.2W	17.3N 165.4W	21.0N 157.5W		495	142	681	226	-	18.0N 161.3W	24.9N 168.5W	16.8N 170.4W	21.6N 152.3W		490	682	930	268	
2418	25.5N 153.9W	25.7N 154.0W	14	23.2N 158.2W	24.5N 145.5W	M	24.2N 158.4W		273	461	-	257	-	17.7N 161.0W	20.8N 156.7W	17.4N 166.5W	19.8N 158.4W		613	322	854	423	-	18.0N 161.3W	23.2N 165.7W	16.1N 165.9W	20.5N 152.3W		610	659	877	313	
2500	26.7N 151.7W	26.5N 151.7W	12	24.3N 157.0W	M	M	25.3N 156.3W	31.4N 151.5W	321	-	-	262	282	21.4N 160.0W	M	19.5N 167.5W	23.7N 159.2W	20.8N 160.1W	555	-	972	445	581	19.0N 160.8W	27.7N 161.6W	17.6N 163.1W	23.3N 151.6W		683	532	1061	204	

* CPHC Mean Vector Error = 31.5 NM
Number of Cases: 23
CPHC Mean 24-hr Error = 192.4 NM
Number of Cases: 19
CPHC Mean 48-hr Error = 331.1 NM
Number of Cases: 15
CPHC Mean 72-hr Error = 476.8 NM
Number of Cases: 11

* The vector error is the distance of the initial position from the best track.

EPHC77 Mean 24-hr Error = 249.2 NM (17)
EPANLG Mean 24-hr Error = 228.7 NM (15)
EPCLPR Mean 24-hr Error = 180.3 NM (19)
MFM Mean 24-hr Error = 142.9 NM (7)

EPHC77 Mean 48-hr Error = 239.0 NM (14)
EPANLG Mean 48-hr Error = 508.9 NM (13)
EPCLPR Mean 48-hr Error = 354.2 NM (15)

EPHC77 Mean 72-hr Error = 955.9 NM (11)
EPANLG Mean 72-hr Error = 644.2 NM (9)
EPCLPR Mean 72-hr Error = 614.4 NM (11)

( ) Number of Cases

Figure 19

NOAA Technical Memoranda NWS

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)

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)

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