

1997 NATIONAL HURRICANE CENTER FORECAST VERIFICATION

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Introduction

Every six hours, the National Hurricane Center issues a 72-hour track and intensity forecast for all tropical cyclones in the north Atlantic and east Pacific basins. Official forecasts are verified by comparison with the final best-track, derived from a post-storm analysis of all available track and intensity data. The best-track data used for verification excludes extratropical, subtropical and tropical depression stages. Climatology and persistence forecasts are used as standards for skill in comparing forecasts: the CLIPER model forecasts for track and the SHIFOR model forecasts for intensity.

Track forecast errors are the great circle distance between a forecast position and a best-track position for the same time. A tropical cyclone's intensity is defined as the maximum one-minute wind speed ten meters above the ground. This maximum speed can occur anywhere within the cyclone's circulation. Forecast and best-track intensities are rounded to the closest five knots. Intensity forecast errors are the absolute difference between the forecast wind speed and the best-track wind speed for the same time. Model objective track guidance is of two types, late or early. Late models require the completion of global numerical models. They are run every twelve hours, except for the Aviation Run of the MRF model which is now run every six hours. These models are initialized about three hours after synoptic time, about the same time the official forecast is issued. Therefore, their forecasts arrive too late for the forecaster to use. Various strategies are employed to provide the forecaster with more timely guidance derived from the late models. These are the early models and are available at any time. [Table 1](#) defines model and other abbreviations used in this report.

North Atlantic

The 1997 north Atlantic hurricane season had 7 tropical storms and hurricanes. This is less than the annual average of 10 and nearly half as many as occurred last year. There were 93 official forecasts issued for tropical storms and hurricanes, with more than half of these issued for Hurricane Erika. The average official forecast track errors by storm are listed in [Table 2.1](#). [Table 2.2](#) gives the average official and CLIPER track error for 1997 and the previous ten-year average. The 1997 official errors are a little larger than the ten-year average at the 12-hour through 36-hour forecast periods and smaller thereafter. The corresponding 1997 CLIPER errors are larger than their ten-year average for all time periods, giving an indication of this year's forecast difficulty. The 1997 departures from the ten-year average error by forecast

period are most easily seen in the latter portion of [Table 2.2](#).

[Table 3.1](#) and [Table 3.2](#) are homogeneous comparisons of the late and early Atlantic track guidance models. Of the late models, the NOGAPS model has the smallest forecast errors at all time periods, except at 12-hour where the GFDL has the smallest error. The very small NOGAPS error at the 48-hour and 72-hour forecast periods is remarkable, in comparison to the performance of the other models. The skill of this model is reflected in the NGPI forecasts of the early models as shown in [Table 3.2](#).

The average official absolute wind speed errors by storm are listed in [Table 4.1](#). [Table 4.2](#) gives the average official and SHIFOR absolute wind speed errors for 1997 and the previous seven-year average. The 1997 official intensity forecast errors are smaller than the SHIFOR errors for all forecast periods, except at the 72-hour. From the departure portion of this Table, the official intensity forecast errors are smaller than the corresponding seven-year average, except for the 72-hour forecast period. Nevertheless, the 1997 official intensity forecasts cannot, necessarily, be viewed as more skillful than normal because the long-term average official and SHIFOR error departures are nearly the same for all time periods.

[Table 5](#) displays the absolute wind speed errors for the objective guidance from early and late models. The official forecast errors are smaller than these for the 12-hour and 24-hour forecast periods, with SHIPS better at the 36-hour period and the GFDL substantially better for the last two periods. Unfortunately, these small GFDL errors occur for the wrong reason. Carefully examination of Erika's GFDL forecasts reveal that it was quick to intensify and just as quick to decay after reaching its peak intensity. For strong storms (order 100 knots), the GFDL model, although initialized at the actual storm intensity, is unable to maintain it through the first few hours of integration. Once stabilized at a lower intensity, the GFDL model predicts the intensity tendency adequately so that, at least for Erika, in three days time, it verified well with the already decaying tropical cyclone.

The preceding conclusions for the 1997 north Atlantic hurricane season should be considered cautiously since over half the track and intensity forecasts can be attributed to Hurricane Erika.

East Pacific

The 1997 East Pacific hurricane season had 17 tropical storms and hurricanes, one more than the long-term average. There were 239 official forecasts issued for tropical storms and hurricanes in the basin this year, more than twice as many as last year. The average official forecast track errors by storm are listed in [Table 6.1](#). [Table 6.2](#) gives the average official and CLIPER track errors for 1997 and the previous nine years, 1988 to 1996. This year's error departures from the long-term average are given in the latter portion of the table. The official forecast track errors are smaller than their nine-year average for all forecast periods, except for the 72-hour period. This year's CLIPER errors are smaller than their nine-year average error for the 12- and 24-hour forecast periods and large thereafter. The tables indicate some track forecast skill this year, compared to the long-term average, except for the 72-hour period where the long-term official and CLIPER percent departure is the same.

[Table 7.1](#) and [Table 7.2](#) are homogeneous comparisons of various track guidance for the east Pacific late and early models, respectively. Of the late models, the UKMET has the smallest error, except for the Aviation Run at the 12-hour forecast period. Unfortunately this year, the NOGAPS model did not perform in the east Pacific as well as it did in the Atlantic. [Table 7.2](#) shows NHC91, the east Pacific statistic-dynamic model, has the smallest error from the 12-hour

through the 36-hour forecast periods. The forecasters appear to be using the early model guidance optimally, having the smallest forecast error, except where UKMI error is smaller at the 48-hour and 72-hour periods.

Table 8.1 gives the average official absolute wind speed errors by storm. The average official and SHIFOR absolute wind speed errors for 1997 and the previous seven-year average are in Table 8.2. As shown in the departure portion of the Table, the official intensity forecast error is larger than the corresponding seven-year average at all forecast time periods. The same is true for SHIFOR. The percent departures are about the same through 24 hours with relatively large SHIFOR errors thereafter, probably indicating real skill for the official forecast in these latter forecast periods.

The absolute wind speed errors for the objective guidance from early and late models are given in Table 9. The official errors are smaller than the model guidance errors for all time periods, except the 72-hour forecast period where the SHIPS model had the smallest error.

Conclusions

1. The official 1997 track forecasts are about average or better than the long-term average for the north Atlantic.
2. The official 1997 track forecasts are better than the long-term average for the east Pacific.
3. On average, the Navy NOGAPS guidance model for the north Atlantic basin produced the best track forecasts.
4. On average, the NHC91 model for the early periods and the UKMET model for the later periods produced the best track forecasts for east Pacific basin.
5. The early objective track guidance appears to be used to good advantage for the east Pacific basin by the forecasters.
6. On average, the SHIPS model, greatly improved for the 1997 hurricane season, produced better intensity forecasts compared to SHIFOR for both the Atlantic and Pacific basins.

TABLE 1

MODEL ABBREVIATIONS

[\(Click here for model descriptions\)](#)

OFCL Official track or intensity forecasts

OFCI Official Track Forecast Interpolated from the previous 6 hours

CLIP CLImatology and PERsistence track model - CLIPER (Atl and Pac)

BAMD Beta Advection Model Deep (Global)

BAMM Beta Advection Model Medium (Global)

BAMS Beta Advection Model Shallow (Global)

A90E NHC90 Statistical-Dynamic Model...early version (Atl)

P91E NHC91 Statistical-Dynamic Model...early version (Pac)

LBAR A simplified version of VICBAR (Atl and Pac)

GFDL GFDL Model (Atl and Pac - track and intensity)

GFDL GFDL Interpolated Track and Intensity (6- and 12-hour)
AVNO MRF Model Aviation Run (Global)
UKM UKMET Model (Global)
UKMI UKMET Interpolated Track Model (6- and 12-hour)
NGPS Navy Operational Global Atmospheric Prediction System - NOGAPS
NGPI NOGAPS Interpolated Track Model (6- and 12-hour)
SHFR Statistical Hurricane Intensity Forecast Model - SHIFOR (Atl and Pac)
SHIP Statistical Hurricane Intensity Prediction Scheme - SHIPS (Atl and Pac)

TABLE 2.1

NORTH ATLANTIC
 1997 OFFICIAL AVERAGE TRACK FORECAST ERRORS (NM) BY STORM

FORECAST ERRORS (NM) FOR AL0197 ANA						
	00	12	24	36	48	72
OFCL	9.0	32.6	49.0	56.2	92.0	
#CASES	8	8	6	4	2	0

FORECAST ERRORS (NM) FOR AL0297 BILL						
	00	12	24	36	48	72
OFCL	15.2	61.9	152.9	296.3		
#CASES	6	6	4	2	0	0

FORECAST ERRORS (NM) FOR AL0397 CLAUDETTE						
	00	12	24	36	48	72
OFCL	11.3	43.0	90.7	213.6	227.6	
#CASES	9	8	7	5	3	0

FORECAST ERRORS (NM) FOR AL0497 DANNY						
	00	12	24	36	48	72
OFCL	7.8	45.2	102.9	139.1	150.3	147.2
#CASES	18	18	16	12	8	1

FORECAST ERRORS (NM) FOR AL0697 ERIKA						
	00	12	24	36	48	72
OFCL	12.9	47.7	85.5	118.3	154.2	231.4
#CASES	47	47	45	43	41	37

FORECAST ERRORS (NM) FOR AL0797 FABIAN						
	00	12	24	36	48	72
OFCL	3.5	59.3	63.0	164.1		
#CASES	3	3	1	1	0	0

FORECAST ERRORS (NM) FOR AL0897 GRACE

	00	12	24	36	48	72
OFCL	20.1	88.2	278.0			
#CASES	3	3	1	0	0	0

TABLE 2.2

NORTH ATLANTIC
1997 OFFICIAL AND CLIPER AVERAGE TRACK ERRORS FOR A HOMOGENEOUS
SAMPLE

PERIOD	00	12	24	36	48	72	(hr)
OFCL	11.5	48.1	92.2	131.4	155.4	229.2	(nm)
CLIP	11.5	63.0	134.6	197.3	244.3	412.1	(nm)
#CASES	94	93	80	67	54	38	

1987 - 1996 OFFICIAL AND CLIPER AVERAGE TRACK ERRORS FOR A
HOMOGENEOUS SAMPLE

PERIOD	00	12	24	36	48	72	(hr)
OFCL	13.4	47.5	88.8	128.4	168.5	250.7	(nm)
CLIP	13.4	55.2	111.1	172.3	234.0	344.7	(nm)
#CASES	1869	1856	1656	1477	1312	1024	

1997 OFFICIAL AND CLIPER AVERAGE ERROR DEPARTURE FROM THE 1987 - 1996
OFFICIAL AND CLIPER AVERAGE TRACK ERROR

PERIOD	00	12	24	36	48	72	(hr)
OFCL DEPARTURE	-14	+01	+04	+02	-08	-09	(%)
CLIP DEPARTURE	-14	+14	+21	+15	+04	+20	(%)

TABLE 3.1

NORTH ATLANTIC
1997 AVERAGE MODEL TRACK ERROR (NM) FOR A HOMOGENEOUS SAMPLE
(LATE*)

	00	12	24	36	48	72
OFCL	11.7	46.5	84.5	106.4	146.6	226.9
CLIP	11.7	57.0	116.2	161.4	231.6	422.3
GFDL	11.7	53.0	82.4	103.5	129.7	202.5

AVNO	11.7	57.5	100.4	148.9	203.7	328.6
UKM	11.7	62.4	87.3	113.7	146.6	226.6
NGPS	11.7	59.5	80.5	98.1	97.4	118.5

#CASES	30	30	27	21	18	14
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* Although CLIPER is an early model, it is included here for reference.

TABLE 3.2

NORTH ATLANTIC
1997 AVERAGE MODEL TRACK ERRORS (NM) FOR A HOMOGENEOUS SAMPLE
(EARLY)

	00	12	24	36	48	72
OFCL	11.5	42.7	78.8	115.6	150.3	241.5
CLIP	11.5	55.5	115.9	169.3	232.8	414.0
A90E	11.5	51.7	96.3	129.5	208.0	438.6
BAMD	11.5	52.2	106.6	159.1	215.2	315.8
BAMM	11.5	55.3	105.7	169.6	243.8	428.6
BAMS	11.5	67.6	131.1	205.2	293.5	526.4
LBAR	11.5	42.1	76.5	102.7	141.9	224.1
OFCL	11.5	50.2	92.7	123.2	154.6	236.2
GFDI	11.5	45.6	74.4	101.4	130.3	205.7
NGPI	11.5	49.4	82.5	98.8	108.0	130.3
#CASES	71	70	62	53	46	33

TABLE 4.1

NORTH ATLANTIC
1997 OFFICIAL AVERAGE ABSOLUTE WIND SPEED FORECAST ERROR (KT) BY
STORM

	FORECAST ERRORS (KT) FOR AL0197 ANA					
	00	12	24	36	48	72
OFCL	3.8	4.4	4.2	5.0	5.0	
#CASES	8	8	6	4	2	0

	FORECAST ERRORS (KT) FOR AL0297 BILL					
	00	12	24	36	48	72
OFCL	8.3	13.3	17.5	12.5		
#CASES	6	6	4	2	0	0

	FORECAST ERRORS (KT) FOR AL0397 CLAUDETTE					
	00	12	24	36	48	72
OFCL	3.3	6.9	10.7	9.0	13.3	
#CASES	9	8	7	5	3	0

FORECAST ERRORS (KT) FOR AL0497 DANNY						
	00	12	24	36	48	72
OFCL	3.9	5.8	9.4	18.8	23.8	10.0
#CASES	18	18	16	12	8	1

FORECAST ERRORS (KT) FOR AL0697 ERIKA						
	00	12	24	36	48	72
OFCL	2.3	4.8	8.1	11.4	14.3	20.9
#CASES	47	47	45	43	41	37

FORECAST ERRORS (KT) FOR AL0797 FABIAN						
	00	12	24	36	48	72
OFCL	5.0	5.0	5.0	.0		
#CASES	3	3	1	1	0	0

FORECAST ERRORS (KT) FOR AL0897 GRACE						
	00	12	24	36	48	72
OFCL	5.0	2.5				
#CASES	2	2	0	0	0	0

TABLE 4.2

**NORTH ATLANTIC
1997 AVERAGE ABSOLUTE WIND SPEED ERROR FOR A HOMOGENEOUS SAMPLE**

PERIOD	00	12	24	36	48	72	(hr)
OFCL	3.4	5.7	8.7	12.0	15.3	20.7	(kt)
SHFR	3.4	7.0	9.7	12.6	15.9	19.9	(kt)
#CASES	93	92	79	67	54	38	

**1990 - 1996 AVERAGE ABSOLUTE WIND SPEED ABSOLUTE ERROR FOR A
HOMOGENEOUS SAMPLE**

PERIOD	00	12	24	36	48	72	(hr)
OFCL	3.5	6.7	10.2	13.0	15.8	19.5	(kt)
SHFR	3.5	8.2	11.7	14.0	16.3	18.7	(kt)
#CASES	1381	1369	1219	1088	964	760	

**1997 OFFICIAL AND SHIFOR AVERAGE ABSOLUTE WIND SPEED ERROR
DEPARTURE FROM THE 1990 - 1996 OFFICIAL AND SHIFOR AVERAGE ABSOLUTE
WIND SPEED ERROR**

PERIOD	00	12	24	36	48	72	(hr)
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OCFL DEPARTURE	-03	-15	-15	-08	-03	+06 (%)
SHFR DEPARTURE	-03	-15	-17	-10	-02	+06 (%)

TABLE 5

**NORTH ATLANTIC
1997 AVERAGE MODEL ABSOLUTE WIND SPEED ERROR (KT) FOR A
HOMOGENEOUS SAMPLE**

	00	12	24	36	48	72
OFCL	2.9	5.4	8.2	12.9	16.0	21.9
SHFR	2.9	6.7	9.7	12.5	15.8	19.8
SHIP	2.9	6.7	8.3	10.1	13.8	14.9
GFDI	2.9	7.2	10.3	13.8	17.0	22.7
GFDL	2.9	11.6	11.4	10.7	10.8	11.3
#CASES	36	36	31	28	25	18

TABLE 6.1

**EAST PACIFIC
1997 OFFICIAL AVERAGE TRACK FORECAST ERRORS (NM) BY STORM**

FORECAST ERRORS (NM) FOR EP0197 ANDRES

	00	12	24	36	48	72
OFCL	17.3	69.2	111.6	144.2	176.0	333.1
#CASES	13	13	11	9	7	3

FORECAST ERRORS (NM) FOR EP0297 BLANCA

	00	12	24	36	48	72
OFCL	5.0	44.3	119.5	242.9		
#CASES	6	6	4	2	0	0

FORECAST ERRORS (NM) FOR EP0497 CARLOS

	00	12	24	36	48	72
OFCL	13.4	21.9	59.7			
#CASES	4	4	2	0	0	0

FORECAST ERRORS (NM) FOR EP0697 DOLORES

	00	12	24	36	48	72
OFCL	8.4	22.8	34.4	43.4	59.0	105.5
#CASES	19	19	17	15	13	9

FORECAST ERRORS (NM) FOR EP0797 ENRIQUE

	00	12	24	36	48	72
OFCL	10.3	35.1	69.7	80.6	97.9	182.9
#CASES	13	13	11	9	7	3

FORECAST ERRORS (NM) FOR EP0897 FELICIA

	00	12	24	36	48	72
OFCL	9.2	32.9	66.7	96.0	125.9	210.1
#CASES	23	23	22	20	18	14

FORECAST ERRORS (NM) FOR EP0997 GUILLERMO

	00	12	24	36	48	72
OFCL	14.0	29.8	48.3	68.6	93.8	149.4
#CASES	39	39	38	36	34	31

FORECAST ERRORS (NM) FOR EP1097 HILDA

	00	12	24	36	48	72
OFCL	10.5	30.6	33.6	60.5	59.8	
#CASES	8	8	6	4	2	0

FORECAST ERRORS (NM) FOR EP1197 IGNACIO

	00	12	24	36	48	72
OFCL	58.6	92.5				
#CASES	1	1	0	0	0	0

FORECAST ERRORS (NM) FOR EP1297 JIMENA

	00	12	24	36	48	72
OFCL	13.0	48.8	101.5	181.7	269.7	455.8
#CASES	13	13	11	9	7	3

FORECAST ERRORS (NM) FOR EP1397 KEVIN

	00	12	24	36	48	72
OFCL	15.0	35.9	31.0	43.1		
#CASES	6	6	4	2	0	0

FORECAST ERRORS (NM) FOR EP1497 LINDA

	00	12	24	36	48	72
OFCL	7.8	32.2	73.7	117.2	163.8	247.4
#CASES	27	27	25	23	21	17

FORECAST ERRORS (NM) FOR EP1597 MARTY

	00	12	24	36	48	72
OFCL	30.6	86.2	178.3			
#CASES	4	4	2	0	0	0

FORECAST ERRORS (NM) FOR EP1697 NORA

	00	12	24	36	48	72
OFCL	7.3	26.1	57.4	98.0	144.4	233.8
#CASES	35	35	33	31	29	25

FORECAST ERRORS (NM) FOR EP1797 OLAF

	00	12	24	36	48	72
OFCL	10.6	42.1	89.3	125.5	92.5	
#CASES	7	7	5	3	1	0

FORECAST ERRORS (NM) FOR EP1897 PAULINE

	00	12	24	36	48	72
OFCL	8.8	35.4	72.0	106.8	134.7	306.0
#CASES	14	14	12	10	8	4

FORECAST ERRORS (NM) FOR EP1997 RICK

	00	12	24	36	48	72
OFCL	8.0	54.4	115.5	183.6	275.3	
#CASES	7	7	5	3	1	0

TABLE 6.2**EAST PACIFIC
1997 OFFICIAL AND CLIPER AVERAGE TRACK ERRORS FOR A HOMOGENEOUS
SAMPLE**

PERIOD	00	12	24	36	48	72	(hr)
OFCL	10.9	35.8	66.8	98.0	129.9	208.4	(nm)
CLIP	10.9	38.9	75.7	118.1	158.5	242.2	(nm)
#CASES	239	239	208	176	148	109	

**EAST PACIFIC
1987 - 1996 OFFICIAL AND CLIPER AVERAGE TRACK ERRORS FOR A
HOMOGENEOUS SAMPLE**

PERIOD	00	12	24	36	48	72	(hr)
OFCL	12.9	38.8	71.3	105.3	138.1	194.3	(nm)
CLIP	12.9	41.2	77.4	117.5	157.1	225.6	(nm)
#CASES	2293	2288	2058	1822	1607	1228	

**1997 OFFICIAL AND CLIPER AVERAGE ERROR DEPARTURE FROM THE 1988 - 1996
OFFICIAL AND CLIPER AVERAGE TRACK ERROR**

PERIOD	00	12	24	36	48	72	(hr)
OFCL DEPARTURE	-16	-08	-06	-07	-06	+07	(%)
CLIP DEPARTURE	-16	-06	-02	+01	+01	+07	(%)

TABLE 7.1**EAST PACIFIC
1997 AVERAGE MODEL TRACK ERROR (NM) FOR A HOMOGENEOUS SAMPLE
(LATE*)**

	00	12	24	36	48	72
OFCL	11.4	33.7	63.4	96.3	137.6	193.6
CLIP	11.4	35.3	68.2	106.4	152.6	201.2
GFDL	11.4	54.6	86.0	109.4	145.1	220.3
AVNO	11.4	45.7	82.5	132.2	194.1	263.8
UKM	11.4	50.0	74.9	102.0	130.8	177.9

NGPS	11.4	60.2	98.3	145.6	189.0	255.3
#CASES	72	72	64	47	35	24

* Although CLIPER is an early model, it is included here for reference.

TABLE 7.2

**EAST PACIFIC
1997 AVERAGE MODEL TRACK ERRORS (NM) FOR A HOMOGENEOUS SAMPLE
(EARLY)**

	00	12	24	36	48	72
OFCL	9.0	31.8	60.9	91.5	130.0	204.1
CLIP	9.0	34.8	69.5	108.8	154.8	223.3
P91E	9.0	34.1	65.9	99.7	136.7	230.7
BAMD	9.0	43.3	78.3	103.2	136.8	229.4
BAMM	9.0	42.5	77.6	109.4	146.5	217.0
BAMS	9.0	47.7	90.4	133.5	174.0	218.2
LBAR	9.0	39.1	75.4	108.1	143.9	270.6
OFCL	9.0	37.9	70.5	106.0	141.9	209.1
GFDI	9.0	49.0	86.5	116.7	151.7	234.9
UKMI	9.0	46.7	88.6	100.4	129.3	191.2
#CASES	162	162	144	105	78	53

TABLE 8.1

**EAST PACIFIC
1997 OFFICIAL AVERAGE ABSOLUTE WIND SPEED FORECAST ERROR (KT) BY
STORM**

FORECAST ERRORS (KT) FOR EP0197 ANDRES						
	00	12	24	36	48	72
OFCL	1.9	8.8	13.6	10.6	14.3	11.7
#CASES	13	13	11	9	7	3

FORECAST ERRORS (KT) FOR EP0297 BLANCA						
	00	12	24	36	48	72
OFCL	2.5	6.7	12.5	10.0	9999.0	9999.0
#CASES	6	6	4	2	0	0

FORECAST ERRORS (KT) FOR EP0497 CARLOS						
	00	12	24	36	48	72
OFCL	2.5	6.3	5.0	9999.0	9999.0	9999.0
#CASES	4	4	2	0	0	0

FORECAST ERRORS (KT) FOR EP0697 DOLORES						
	00	12	24	36	48	72
OFCL	1.3	4.2	6.2	4.0	2.3	6.1
#CASES	19	19	17	15	13	9

FORECAST ERRORS (KT) FOR EP0797 ENRIQUE

	00	12	24	36	48	72
OFCL	2.7	6.9	16.4	23.9	23.6	31.7
#CASES	13	13	11	9	7	3

FORECAST ERRORS (KT) FOR EP0897 FELICIA

	00	12	24	36	48	72
OFCL	2.0	9.1	18.4	21.5	26.1	32.5
#CASES	23	23	22	20	18	14

FORECAST ERRORS (KT) FOR EP0997 GUILLERMO

	00	12	24	36	48	72
OFCL	3.3	7.6	12.9	18.1	22.2	29.5
#CASES	39	39	38	36	34	31

FORECAST ERRORS (KT) FOR EP1097 HILDA

	00	12	24	36	48	72
OFCL	3.8	10.6	12.5	10.0	2.5	9999.0
#CASES	8	8	6	4	2	0

FORECAST ERRORS (KT) FOR EP1197 IGNACIO

	00	12	24	36	48	72
OFCL	5.0	5.0	9999.0	9999.0	9999.0	9999.0
#CASES	1	1	0	0	0	0

FORECAST ERRORS (KT) FOR EP1297 JIMENA

	00	12	24	36	48	72
OFCL	6.9	18.5	24.1	32.8	43.6	21.7
#CASES	13	13	11	9	7	3

FORECAST ERRORS (KT) FOR EP1397 KEVIN

	00	12	24	36	48	72
OFCL	.8	5.8	6.3	10.0	9999.0	9999.0
#CASES	6	6	4	2	0	0

FORECAST ERRORS (KT) FOR EP1497 LINDA

	00	12	24	36	48	72
OFCL	5.6	12.0	20.8	29.6	33.6	35.0
#CASES	27	27	25	23	21	17

FORECAST ERRORS (KT) FOR EP1597 MARTY

	00	12	24	36	48	72
OFCL	.0	6.3	10.0	9999.0	9999.0	9999.0
#CASES	4	4	2	0	0	0

FORECAST ERRORS (KT) FOR EP1697 NORA

	00	12	24	36	48	72
OFCL	4.1	9.4	15.6	19.2	19.0	10.8
#CASES	35	35	33	31	29	25

FORECAST ERRORS (KT) FOR EP1797 OLAF

	00	12	24	36	48	72
OFCL	6.4	7.9	19.0	20.0	20.0	9999.0
#CASES	7	7	5	3	1	0

FORECAST ERRORS (KT) FOR EP1897 PAULINE

	00	12	24	36	48	72
OFCL	8.6	17.1	22.1	19.5	20.0	5.0
#CASES	14	14	12	10	8	4

	FORECAST ERRORS (KT) FOR EP1997 RICK					
	00	12	24	36	48	72
OFCL	5.0	11.4	26.0	21.7	10.0	9999.0
#CASES	7	7	5	3	1	0

TABLE 8.2

**EAST PACIFIC
1997 AVERAGE ABSOLUTE WIND SPEED ERROR FOR A HOMOGENEOUS SAMPLE**

PERIOD	00	12	24	36	48	72	(hr)
OFCL	3.8	9.5	15.9	19.4	22.1	23.0	(kt)
SHFR	3.8	10.2	16.8	22.1	26.2	28.3	(kt)
#CASES	239	239	208	176	148	109	

**1990 - 1996 AVERAGE ABSOLUTE WIND SPEED ABSOLUTE ERROR FOR A
HOMOGENEOUS SAMPLE**

PERIOD	00	12	24	36	48	72	(hr)
OFCL	3.0	7.0	12.0	15.9	18.5	21.4	(kt)
SHFR	3.0	7.9	13.0	17.1	20.0	23.5	(kt)
#CASES	1909	1905	1724	1548	1373	1062	

**1997 OFFICIAL AND SHIFOR AVERAGE ABSOLUTE WIND SPEED ERROR
DEPARTURE FROM THE 1990 - 1996 OFFICIAL AND SHIFOR AVERAGE ABSOLUTE
WIND SPEED ERROR**

PERIOD	00	12	24	36	48	72	(hr)
OCFL DEPARTURE	+27	+36	+33	+22	+19	+07	(%)
SHFR DEPARTURE	+27	+30	+29	+29	+31	+20	(%)

TABLE 9

**EAST PACIFIC
1997 AVERAGE MODEL ABSOLUTE WIND SPEED ERROR (KT) FOR A
HOMOGENEOUS SAMPLE**

	00	12	24	36	48	72
OFCL	3.9	10.0	16.1	19.0	21.6	23.9
SHFR	3.9	11.2	17.4	22.1	25.5	28.4
SHIP	3.9	11.2	16.5	19.4	22.7	23.0
GFDI	3.9	15.0	21.7	28.2	33.6	44.3

GFDL	3.9	22.2	25.4	28.0	28.6	27.5
#CASES	106	106	92	76	65	46