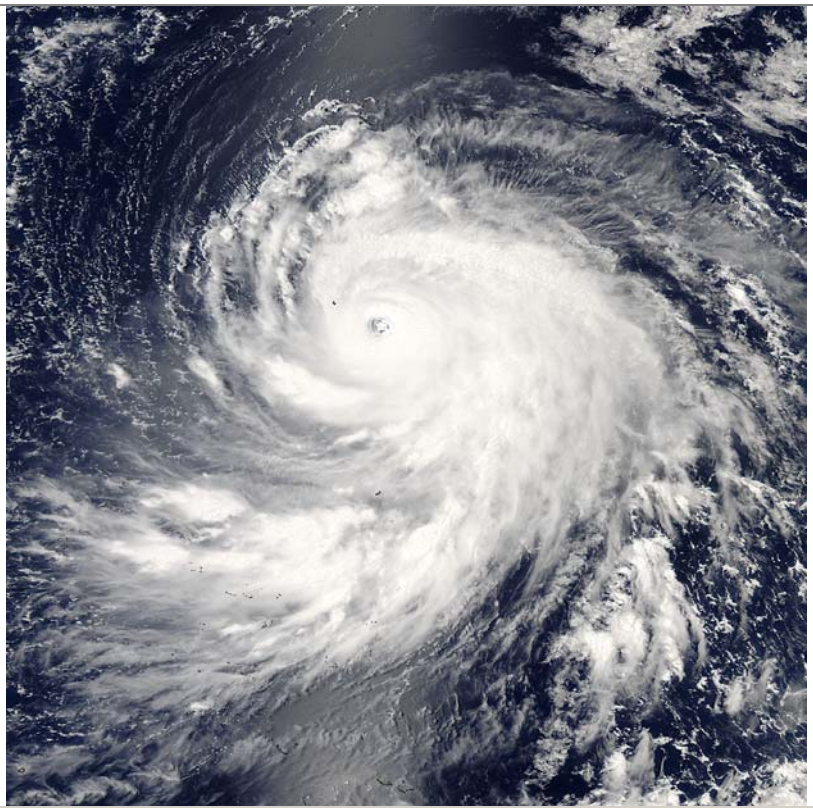
2006

Annual Tropical Cyclone Report

U.S. Naval Maritime Forecast Center/ Joint Typhoon Warning Center
Pearl Harbor, Hawaii



Composite MODIS true color image from the Aqua satellite of Super Typhoon 01C (Ioke) as it approaches Wake Island, taken on 31 August, 2006. Image courtesy of MODIS Rapid Response Team, NASA Goddard Space Flight Center.

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EDITOR'S NOTE

The 2006 ATCR has seen additional streamlining of the process due to manning issues from the previous years. Additional changes include introduction of the new Naval Maritime Forecast Center/Joint Typhoon Warning Center logo and a multitude of recoding of website to increase loading speed. Again this year, we are including links to NRL and FNMOC as the sources of imagery for the related systems. We have also removed the pdf versions due to the scaled back nature of the individual system pages.

To use the ATCR, expanding menus indicated by plus (+) and minus (-) signs in the frame on the left side of the screen permit easy navigation. Simply click any (+) sign to open a menu another level.

Feedback is much appreciated and needed to create a product that will remain valuable in future years. Please email the editor at the following link.

ATCR Editor

LT A. D. Lana, USN

Editor, 2006 ATCR

1. SUMMARY OF WESTERN NORTH PACIFIC AND NORTH INDIAN OCEAN TROPICAL CYCLONES

1.1 WESTERN NORTH PACIFIC OCEAN TROPICAL CYCLONES

This year's tropical cyclones are listed in Table 1-1. Table 1-2 shows the monthly distribution of tropical cyclones for each year since 1959 and Table 1-3 shows the monthly average occurrence of tropical storms separated into: (1) typhoons only; and (2) tropical storms and typhoons. A summary of this year's Tropical Cyclone Formation Alerts is shown in Table 1-4. The annual number of tropical cyclones of tropical storm strength or higher appear in Figure 1-1, while the number of super typhoons are shown in Figure 1-2. Figure 1-3 illustrates a monthly breakdown of system formations based on intensity categories. Composites of the tropical cyclone best tracks for the Western North Pacific appear following Figure 1-3.

Table 1-1 WESTERN NORTH PACIFIC SIGNIFICANT TROPICAL CYCLONES FOR 2006 (01 JAN 2006 - 31 DEC 2006)

TC	NAME*	PERIOD**	WARNINGS ISSUED	EST MAX SFC WINDS KTS	MSLP (MB)***
TS 01W	-	04 MAR – 07 MAR	13	35	996
TY 02W	CHANCHU	08 MAY - 18 MAY	38	125	929
TS 03W	JELAWAT	26 JUN - 29 JUN	13	45	989
STY 04W	EWINIAR	29 JUN - 1- JUL	43	130	926
TS 05W	BILIS	08 JUL - 14 JUL	26	50	985
TY 06W	KAEMI	18 JUL - 25 JUL	31	85	959
TY 07W	PRAPIROON	31 JUL - 03 AUG	16	70	970
STY 08W	SAOMAI	04 AUG - 10 AUG	25	140	918
TS 09W	MARIA	05 AUG - 09 AUG	14	60	978
TS 10W	BOPHA	06 AUG - 10 AUG	18	55	982
TS 11W	WUKONG	12 AUG - 19 AUG	27	55	982
TS 12W	SONAMU	13 AUG - 16 AUG	10	45	989
TD 13W	-	24 AUG - 25 AUG	2	30	1000
TY 14W	SHANSHAN	10 AUG - 17 SEP	32	120	933
TD 15W	-	12 SEP - 13 SEP	4	30	1000
STY 16W	YAGI	17 SEP - 24 SEP	29	140	918
TS 17W	-	23 SEP - 25 SEP	9	35	996
TY 18W	XANGSANE	25 SEP - 01 OCT	24	125	929
TS 19W	BEBINCA	01 OCT - 06 OCT	19	35	996
TD 20W	RUMBIA	04 OCT - 06 OCT	6	30	1000
TY 21W	SOULIK	09 OCT - 15 OCT	28	90	956
STY 22W	CIMARON	26 OCT - 04 NOV	36	140	918

TY 23W	CHEBI	09 NOV - 14 NOV	23	125	929
STY 24W	DURIAN	25 NOV - 05 DEC	41	135	922
TY 25W	UTOR	07 DEC - 14 DEC	29	100	948
TD 26W	TRAMI	17 DEC - 18 DEC	7	30	1000
STY 01C	IOKE	20 AUG - 05 SEP	67	140	918
* As Designated by RSMC Tokyo or CPHC					
** Dates are based on the issuance of JTWC warnings on system.					
*** MSLP Converted from estimated maximum surface winds using Atkinson/Holliday wind-pressure relationship					

Table 1-2 DISTRIBUTION OF WESTERN NORTH PACIFIC TROPICAL CYCLONES FOR 1959 - 2006

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
1959	0	1	1	1	0	1	3	8	9	3	2	2	31
	0 0 0	0 1 0	0 1 0	1 0 0	0 0 0	0 0 1	1 1 1	5 1 2	4 2 3	2 1 0	2 0 0	2 0 0	17 7 7
1960	1	0	1	1	1	3	3	9	5	4	1	1	30
	0 0 1	0 0 0	0 0 1	1 0 0	0 1 0	2 1 0	2 1 0	8 1 0	0 4 1	4 0 0	1 0 0	1 0 0	19 8 3
1961	1	1	1	1	4	6	5	7	6	7	2	1	42
	0 1 0	0 1 0	1 0 0	0 1 0	2 1 1	1 1 4	3 2 0	3 1 3	5 1 0	3 2 2	1 0 1	1 0 0	20 11 11
1962	0	1	0	1	3	0	8	8	7	5	4	2	39
	0 0 0	0 1 0	0 0 0	1 0 0	2 0 1	0 0 0	5 1 2	7 0 1	3 1 3	3 1 1	3 0 1	0 2 0	24 6 9
1963	0	0	1	1	0	4	5	4	4	6	0	3	28
	0 0 0	0 0 0	0 0 1	1 0 0	0 0 0	3 1 0	3 1 1	3 0 1	2 2 0	5 1 0	0 0 0	2 1 0	19 6 3
1964	0	0	0	0	3	2	8	8	8	7	6	2	44
	0 0 0	0 0 0	0 0 0	0 0 0	2 0 1	2 0 0	6 1 1	3 5 0	5 2 1	3 3 1	4 2 0	1 0 1	26 13 5
1965	2	2	1	1	2	4	6	7	9	3	2	1	40
	1 1 0	0 2 0	0 1 0	1 0 0	1 0 1	3 1 0	4 1 1	3 2 2	5 3 1	2 0 1	1 1 0	0 1 0	21 13 6
1966	0	0	0	1	2	1	4	9	10	4	5	2	38
	0 0 0	0 0 0	0 0 0	1 0 0	2 0 0	1 0 0	3 1 0	5 3 1	5 3 2	1 1 2	1 2 2	1 0 1	20 10 8
1967	1	0	2	1	1	1	8	10	8	4	4	1	41
	0 1 0	0 0 0	1 1 0	1 0 0	0 1 0	1 0 0	3 3 2	3 4 3	5 3 0	2 1 1	4 0 0	0 1 0	20 15 6
1968	0	1	0	1	0	4	3	8	4	6	4	0	31
	0 0 0	0 0 1	0 0 0	1 0 0	0 0 0	2 0 2	1 2 0	3 4 1	4 0 0	5 1 0	4 0 0	0 0 0	20 7 4
1969	1	0	1	1	0	0	3	3	6	5	2	1	23
	1 0 0	0 0 0	0 1 0	1 0 0	0 0 0	0 0 0	2 1 0	2 1 0	2 0 4	4 1 0	1 1 0	0 1 0	13 6 4
1970	0	1	0	0	0	2	3	7	4	6	4	0	27
	0 0 0	1 0 0	0 0 0	0 0 0	0 0 0	1 1 0	0 2 1	4 2 1	2 2 0	3 2 1	1 3 0	0 0 0	12 12 3
1971	1	0	1	2	5	2	8	5	7	4	2	0	37
	0 1 0	0 0 0	0 1 0	2 0 0	2 3 0	2 0 0	6 2 0	3 1 1	5 1 1	3 1 0	1 1 0	0 0 0	24 11 2
1972	1	0	1	0	0	4	5	5	6	5	2	3	32
	1 0 0	0 0 0	0 0 1	0 0 0	0 0 0	2 2 0	4 1 0	3 2 0	4 1 1	4 1 0	2 0 0	2 1 0	22 8 2
1973	0	0	0	0	0	0	7	6	3	4	3	0	23
	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	4 3 0	2 3 1	2 0 1	4 0 0	0 3 0	0 0 0	12 9 2
1974	1	0	1	1	1	4	5	7	5	4	4	2	35
	0 1 0	0 0 0	0 1 0	0 1 0	1 0 0	1 2 1	2 3 0	2 3 2	3 2 0	4 0 0	2 2 0	0 2 0	15 17 3

1975	1	0	0	1	0	0	1	6	5	6	3	2	25
	1 0 0	0 0 0	0 0 0	0 0 1	0 0 0	0 0 0	0 1 0	4 1 1	4 1 0	3 2 1	2 1 0	0 2 0	14 6 5
1976	1	1	0	2	2	2	4	4	5	0	2	2	25
	1 0 0	0 1 0	0 0 0	1 1 0	2 0 0	2 0 0	2 2 0	1 3 0	4 1 0	0 0 0	1 1 0	0 2 0	14 11 0
1977	0	0	1	0	1	1	4	2	5	4	2	1	21
	0 0 0	0 0 0	0 1 0	0 0 0	0 0 1	0 1 0	3 0 1	0 2 0	2 3 0	3 1 0	2 0 0	1 0 0	11 8 2
1978	1	0	0	1	0	3	4	8	4	7	4	0	32
	0 1 0	0 0 0	0 0 0	1 0 0	0 0 0	0 3 0	3 1 0	3 4 1	3 1 0	4 1 2	1 2 1	0 0 0	15 13 4
1979	1	0	1	1	2	0	5	4	6	3	2	3	28
	1 0 0	0 0 0	1 0 0	1 0 0	0 1 1	0 0 0	2 2 1	2 0 2	3 3 0	2 1 0	1 1 0	1 1 1	14 9 5
1980	0	0	1	1	4	1	5	3	7	4	1	1	28
	0 0 0	0 0 0	0 0 1	0 1 0	2 2 0	0 1 0	3 1 1	2 0 1	5 1 1	2 2 0	1 0 0	0 1 0	15 9 4
1981	0	0	1	1	1	2	5	8	4	2	3	2	29
	0 0 0	0 0 0	1 0 0	0 1 0	0 1 0	2 0 0	2 3 0	2 5 1	4 0 0	1 1 0	2 1 0	2 0 0	16 12 1
1982	0	0	3	0	1	3	4	5	6	4	1	1	28
	0 0 0	0 0 0	2 1 0	0 0 0	1 0 0	1 2 0	2 2 0	5 0 0	3 2 1	3 0 1	1 0 0	1 0 0	19 7 2
1983	0	0	0	0	0	1	3	6	3	5	5	2	25
	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 1 0	3 0 0	2 3 1	1 1 1	3 2 0	3 2 0	0 2 0	12 11 2
1984	0	0	0	0	0	2	5	7	4	8	3	1	30
	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 2 0	4 1 0	2 3 2	1 3 0	5 4 1	3 0 0	1 0 0	16 13 3
1985	2	0	0	0	1	3	1	7	5	5	1	2	27
	0 2 0	0 0 0	0 0 0	0 0 0	1 0 0	2 0 1	1 0 0	5 2 0	3 2 0	4 1 0	0 1 0	1 1 0	17 9 1
1986	0	1	0	1	2	2	2	5	2	5	4	3	27
	0 0 0	1 0 0	0 0 0	1 0 0	1 1 0	1 1 0	2 0 0	4 1 0	2 0 0	3 2 0	2 2 0	2 1 0	19 8 0
1987	1	0	0	1	0	2	4	4	7	2	3	1	25
	1 0 0	0 0 0	0 0 0	0 1 0	0 0 0	1 1 0	4 0 0	3 1 0	5 1 1	2 0 0	1 2 0	1 0 0	18 6 1
1988	1	0	0	0	1	3	2	5	8	4	2	1	27
	1 0 0	0 0 0	0 0 0	0 0 0	1 0 0	1 1 1	1 1 0	2 3 0	2 6 0	4 0 0	2 0 0	0 1 0	14 12 1
1989	1	0	0	1	2	2	6	8	4	6	3	2	35
	0 1 0	0 0 0	0 0 0	1 0 0	2 0 0	1 1 0	2 3 1	3 3 2	2 2 0	6 0 0	3 0 0	1 0 1	21 10 4
1990	1	0	0	1	2	4	4	5	5	5	4	1	32
	1 0 0	0 0 0	0 0 0	0 1 0	1 1 0	2 1 1	2 2 0	5 0 0	4 1 0	2 3 0	3 1 0	1 0 0	21 10 1
1991	0	0	2	1	1	1	4	8	6	3	6	0	32
	0 0 0	0 0 0	1 1 0	0 1 0	1 0 0	1 0 0	4 0 0	3 3 2	4 2 0	3 0 0	3 3 0	0 0 0	20 10 2
1992	1	1	0	0	0	3	4	8	5	6	5	0	33
	1 0 0	0 1 0	0 0 0	0 0 0	0 0 0	2 1 0	2 2 0	4 4 0	4 1 0	5 1 0	3 1 1	0 0 0	21 11 1
1993	0	0	2	2	1	2	5	8	5	6	4	3	38
	0 0 0	0 0 0	0 1 1	0 0 2	0 1 0	1 0 1	3 2 0	6 1 1	4 1 0	3 2 1	1 1 2	3 0 0	21 9 8
1994	1	0	1	0	2	2	9	9	8	7	0	2	41
	0 0 1	0 0 0	1 0 0	0 0 0	1 0 1	0 2 0	3 4 2	6 3 0	4 4 0	5 1 1	0 0 0	1 1 0	21 15 5
1995	1	0	0	0	1	2	3	7	7	8	2	3	34
	0 0 1	0 0 0	0 0 0	0 0 0	0 1 0	0 2 0	2 1 0	4 2 1	4 1 2	5 1 2	0 2 0	0 1 2	15 11 8
1996	1	1	0	2	2	0	7	10	7	5	6	3	43
	0 0 1	0 0 1	0 0 0	0 1 1	1 1 0	0 0 0	6 1 0	4 3 3	6 1 0	2 1 2	1 3 2	1 1 1	21 12 11
1997	1	0	0	2	3	3	4	8	4	6	1	1	33
	0 1 0	0 0 0	0 0 0	1 1 0	1 2 0	3 0 0	3 1 0	6 1 1	3 1 0	4 1 1	1 0 0	1 0 0	23 8 2
1998	0	0	0	0	0	0	3	3	8	6	3	4	27
	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 1 2	2 1 0	4 1 3	2 1 3	0 3 0	1 1 2	9 8 10

1999	1	1	0	3	0	1	5	9	6	2	3	3	34
	0 1 0	0 1 0	0 0 0	2 1 0	0 0 0	1 0 0	1 1 3	4 2 3	2 4 0	1 1 0	1 1 1	0 0 3	12 12 10
2000	0	0	0	0	4	0	8	9	6	3	3	1	34
	0 0 0	0 0 0	0 0 0	0 0 0	1 1 2	0 0 0	2 3 3	4 3 2	4 1 1	2 1 0	1 1 1	1 0 0	15 10 9
2001	0	1	0	1	1	2	6	7	5	3	3	4	33
	0 0 0	0 0 1	0 0 0	0 0 1	0 1 0	2 0 0	4 1 1	3 3 1	5 0 0	3 0 0	1 2 0	2 2 0	20 9 4
2002	1	1	1	1	2	3	6	8	3	5	1	1	33
	0 1 0	1 0 0	0 0 1	0 0 1	1 0 1	3 0 0	3 2 1	4 3 1	1 2 0	3 0 2	1 0 0	1 0 0	18 8 7
2003	1	0	0	1	3	2	2	5	3	6	3	1	27
	0 1 0	0 0 0	0 0 0	1 0 0	1 1 1	1 1 0	2 0 0	4 1 0	3 0 0	2 1 3	3 0 0	0 1 0	17 6 4
2004	0	1	1	1	3	5	2	9	3	3	2	2	32
	0 0 0	0 1 0	0 1 0	1 0 0	2 1 0	5 0 0	1 1 0	6 2 1	1 1 1	3 0 0	2 0 0	0 2 0	21 9 2
2005	1	0	1	1	0	1	4	6	5	3	2	1	25
	1 0 0	0 0 0	1 0 0	1 0 0	0 0 0	1 0 0	1 3 0	6 0 0	4 1 0	2 0 1	1 1 0	0 1 0	18 6 1
2006	0	0	1	0	1	1	3	8	5	4	2	2	27
	0 0 0	0 0 0	0 1 0	0 0 0	1 0 0	0 1 0	2 1 0	3 4 1	3 0 2	2 1 1	2 0 0	1 0 1	14 8 5
(1959-2006)													
MEAN	0.6	0.3	0.6	0.8	1.4	2.0	4.5	6.7	5.6	4.6	2.8	1.6	31.5
CASES	28	15	27	39	65	97	218	320	267	223	136	77	1511

The criteria used in TABLE 1-2 are as follows:

1) If a tropical cyclone was first warned on during the last two days of a particular month and continued into the next month for longer than two days, then that system was attributed to the second month.

2) If a tropical cyclone was warned on prior to the last two days of a month, it was attributed to the first month, regardless of how long the system lasted.

3) If a tropical cyclone began on the last day of the month and ended on the first day of the next month, that system was attributed to the first month. However, if a tropical cyclone began on the last day of the month and continued into the next month for only two days, then it was attributed to the second month.

Table 1-2 Legend:		
Total month/year		
GTE 64 knots (Typhoon)	34 to 63 knots (Tropical Storm)	LTE 33 knots (Tropical Depression)

TABLE 1-3 WESTERN NORTH PACIFIC TROPICAL CYCLONES													
TYPHOONS (1945-1958)													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
MEAN	0.4	0.1	0.3	0.4	0.7	1.1	2.0	2.9	3.2	2.4	2.0	0.9	24.4
CASES	5	1	4	5	10	15	28	41	45	34	28	12	228
TYPHOONS (1959-2006)													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
MEAN	0.2	0.1	0.2	0.4	0.7	1.1	2.5	3.5	3.3	3.0	1.6	0.7	16.9
CASES	11	3	9	19	32	54	122	166	158	145	75	34	809
TROPICAL STORMS AND TYPHOONS (1945-1958)													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS

CASES	6	2	7	8	11	22	44	60	64	49	41	18	332
TROPICAL STORMS AND TYPHOONS (1959-2006)													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
MEAN	0.5	0.2	0.4	0.6	1.0	1.6	3.8	5.1	4.6	3.8	2.4	1.2	25.8

TABLE 1-4 TROPICAL CYCLONE FORMATION ALERTS FOR THE WESTERN NORTH PACIFIC OCEAN FOR 1976-2006

YEAR	INITIAL TCFAS	TROPICAL CYCLONES WITH TCFAS	TOTAL TROPICAL CYCLONES	PROBABILITY OF TCFA WITHOUT WARNING*	PROBABILITY OF TCFA BEFORE WARNING
1976	34	25	25	26%	100%
1977	26	20	21	23%	95%
1978	32	27	32	16%	84%
1979	27	23	28	15%	82%
1980	37	28	28	24%	100%
1981	29	28	29	3%	97%
1982	36	26	28	28%	93%
1983	31	25	25	19%	100%
1984	37	30	30	19%	100%
1985	39	26	27	33%	96%
1986	38	27	27	29%	100%
1987	31	24	25	23%	96%
1988	33	26	27	21%	96%
1989	51	32	35	37%	91%
1990	33	30	31	9%	97%
1991	37	29	31	22%	94%
1992	36	32	32	11%	100%
1993	50	35	38	30%	92%
1994	50	40	40	20%	100%
1995	54	33	35	39%	94%
1996	41	39	43	5%	91%
1997	36	30	33	17%	91%
1998	38	18	27	53%	67%
1999	39	29	33	26%	88%
2000	40	31	34	23%	91%
2001	34	28	33	18%	85%
2002	39	31	33	21%	94%
2003	31	27	27	13%	100%
2004	35	32	32	9%	100%
2005	26	25	25	4%	100%
2006	23	22	26	4%	85%
(1976-2006)					
MEAN:	36.2	28.3	30.3	26.1%	93.4%
CASES:	1123	878	940		

* Percentage of initial TCFAs not followed by warnings.

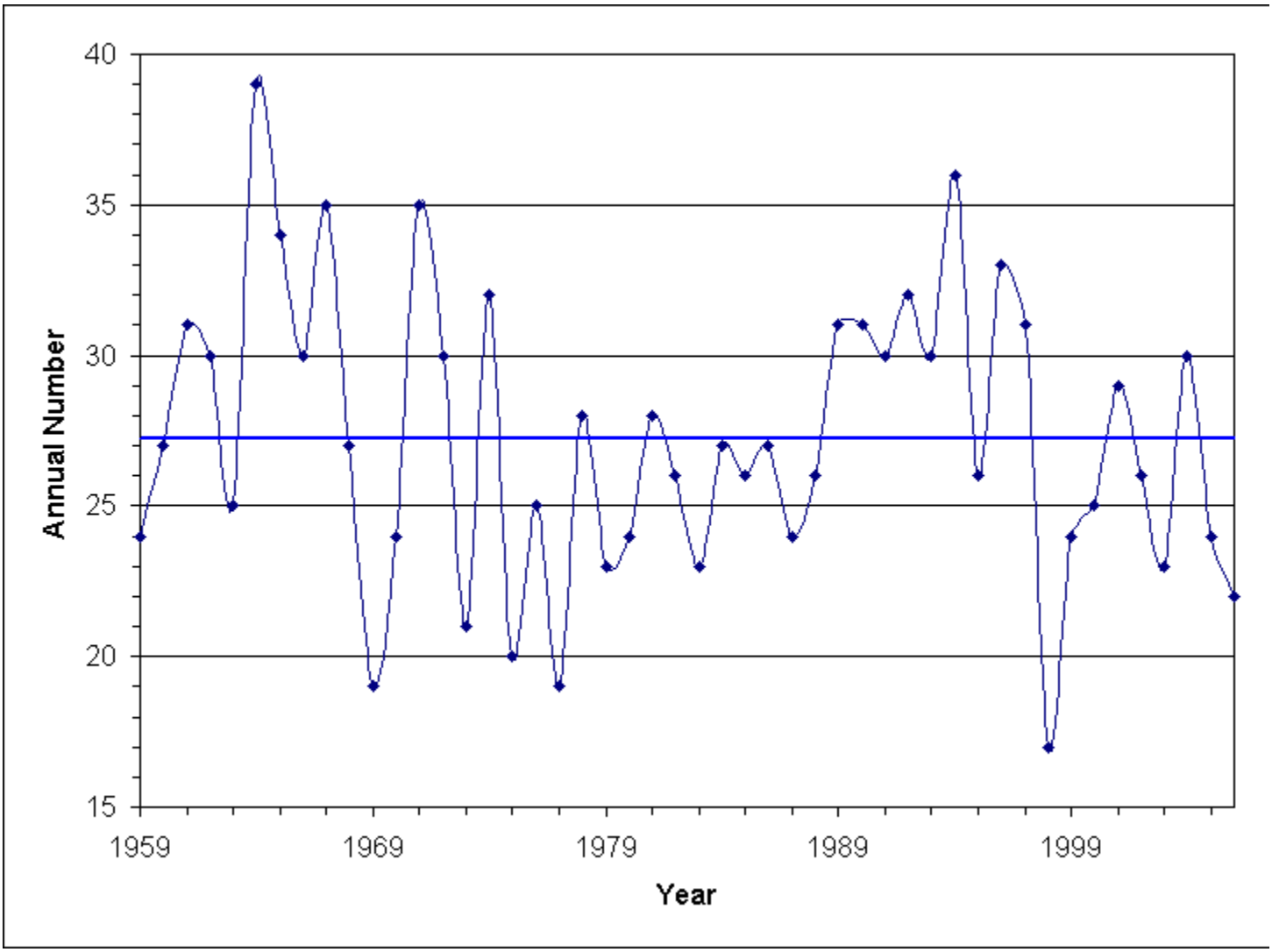


Figure 1-1. Tropical cyclones of tropical storm or greater intensity in the western North Pacific (1959-2006).

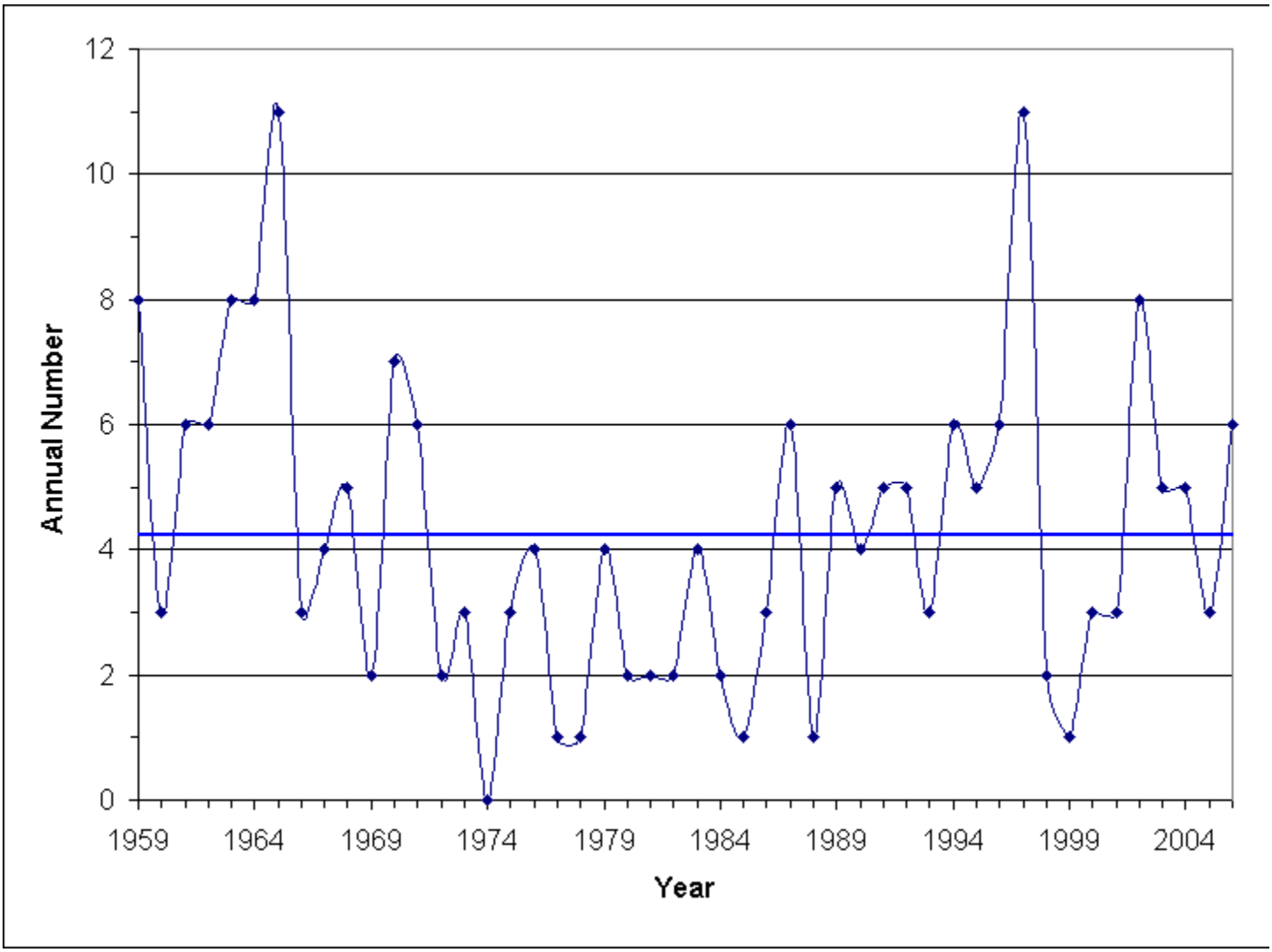


Figure 1-2. Number of Western North Pacific super typhoons (1959-2006).

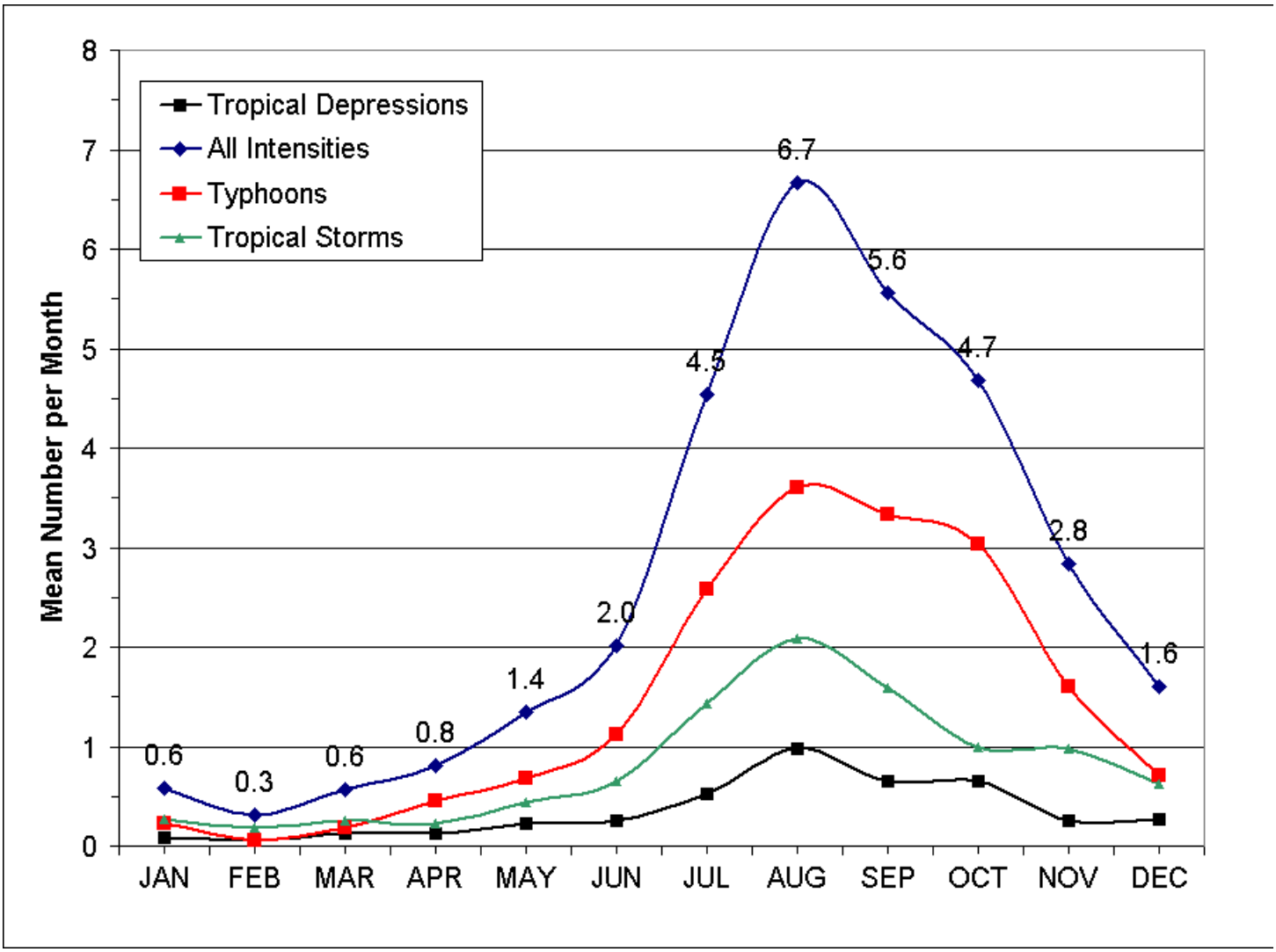
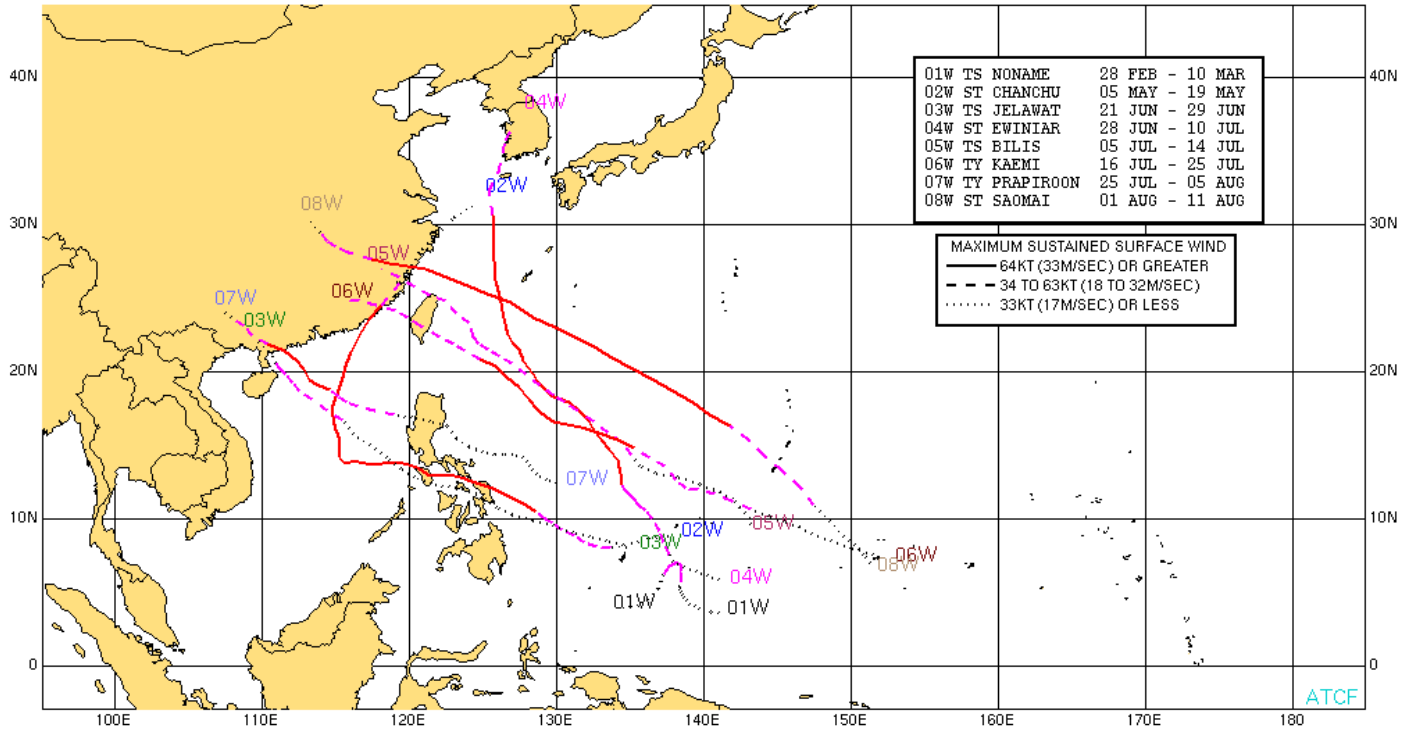
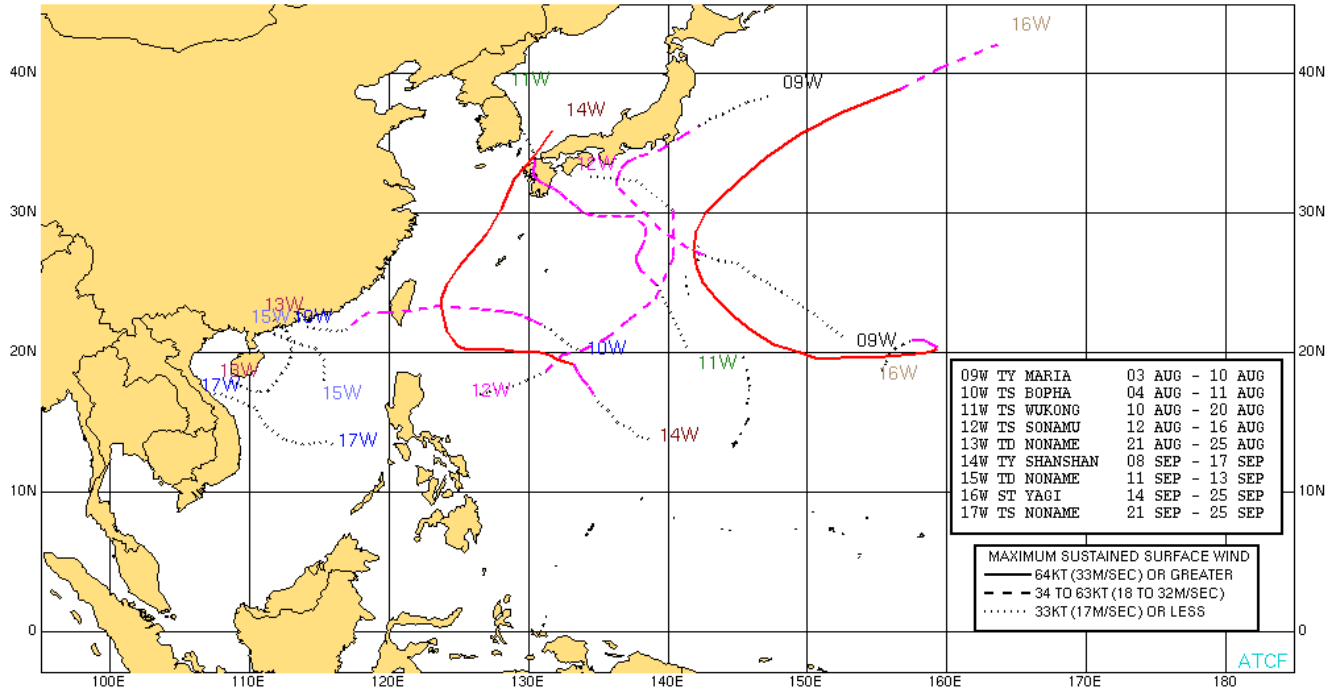


Figure 1-3. Average monthly tropical cyclones of all strengths (1959-2006).

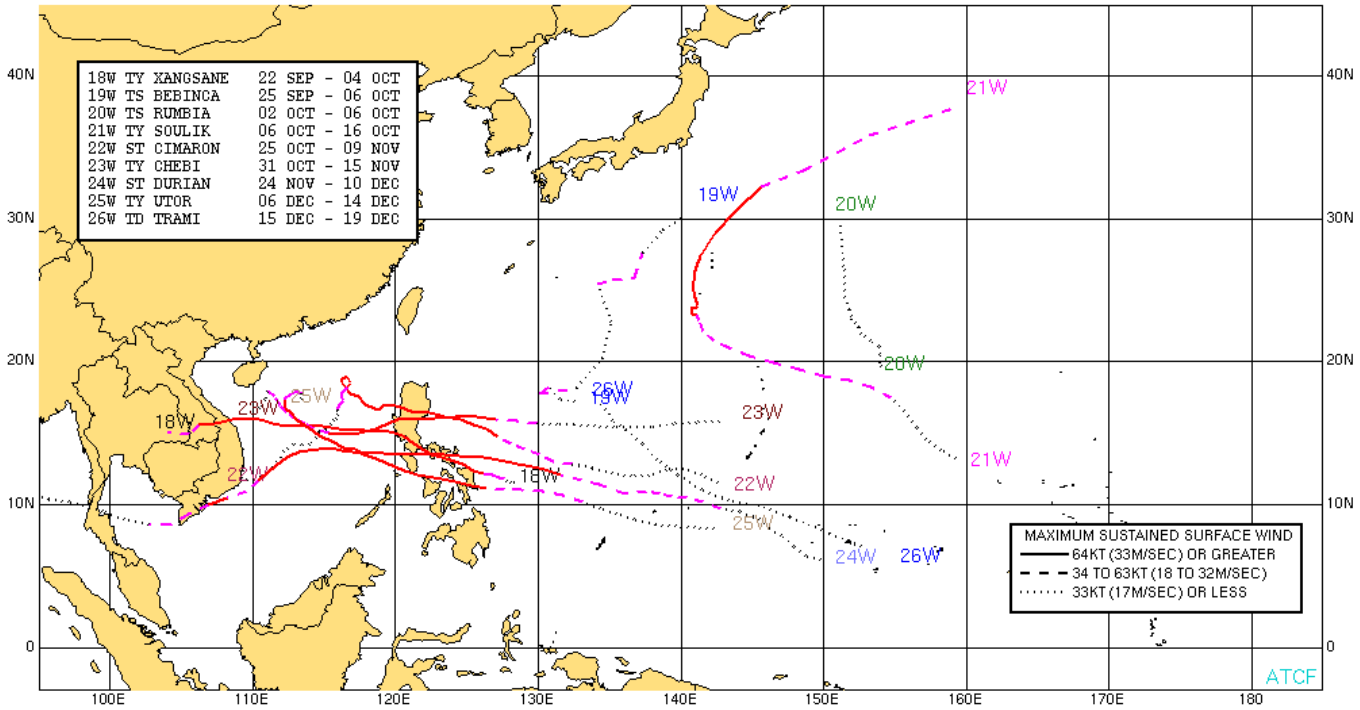
NORTHWEST PACIFIC TROPICAL CYCLONES 28 FEB – 11 AUG



NORTHWEST PACIFIC TROPICAL CYCLONES 03 AUG – 25 SEP



NORTHWEST PACIFIC TROPICAL CYCLONES 22 SEP – 19 DEC



1.2 NORTH INDIAN OCEAN TROPICAL CYCLONES

This year's North Indian Ocean tropical cyclones are listed in Table 1-5. The monthly distribution of tropical cyclones for each year since 1975 is shown in Table 1-6. A composite of the tropical cyclone best tracks for the Northern Indian Ocean appears following Table 1-6.

Table 1-5 NORTH INDIAN OCEAN SIGNIFICANT TROPICAL CYCLONES FOR 2006 (01 JAN 2006 - 31 DEC 2006)

TC	NAME	PERIOD	WARNINGS ISSUED	EST MAX SFC WINDS KTS	MSLP (MB)**
01A	-	13 JAN - 14 JAN	3	45	989
02B	MALA	24 APR - 29 APR	12	120	933
03B	-	02 JUL - 03 JUL	2	35	996
04A	MUKDA	21 SEP - 24 SEP	9	60	978
05B	-	28 SEP - 29 SEP	3	35	996
06B*	-	-	-	55	982
		Total #	29		

* 06B ia a system that developed but was never warned upon.

Table 1-6 DISTRIBUTION OF NORTH INDIAN OCEAN TROPICAL CYCLONES FOR 1975 - 2006

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
1975	1	0	0	0	2	0	0	0	0	1	2	0	6
	010	000	000	000	200	000	000	000	000	100	020	000	330
1976	0	0	0	1	0	1	0	0	1	1	0	1	5
	000	000	000	010	000	010	000	000	010	010	000	010	050
1977	0	0	0	0	1	1	0	0	0	1	0	2	5
	000	000	000	000	010	010	000	000	000	010	000	110	140
1978	0	0	0	0	1	0	0	0	0	1	2	0	4
	000	000	000	000	010	000	000	000	000	010	200	000	220
1979	0	0	0	0	1	1	0	0	2	1	2	0	7
	000	000	000	000	100	010	000	000	011	010	011	000	142
1980	0	0	0	0	0	0	0	0	0	0	1	1	2
	000	000	000	000	000	000	000	000	000	000	010	010	020
1981	0	0	0	0	0	0	0	0	1	0	1	1	3
	000	000	000	000	000	000	000	000	010	000	100	100	210
1982	0	0	0	0	1	1	0	0	0	2	1	0	5
	000	000	000	000	100	010	000	000	000	020	100	000	230
1983	0	0	0	0	0	0	0	1	0	1	1	0	3

	000	000	000	000	000	000	000	010	000	010	010	000	030
1984	0	0	0	0	1	0	0	0	0	1	2	0	4
	000	000	000	000	010	000	000	000	000	010	200	000	220
1985	0	0	0	0	2	0	0	0	0	2	1	1	6
	000	000	000	000	020	000	000	000	000	020	010	010	060
1986	1	0	0	0	0	0	0	0	0	0	2	0	3
	010	000	000	000	000	000	000	000	000	000	020	000	030
1987	0	1	0	0	0	2	0	0	0	2	1	2	8
	000	010	000	000	000	020	000	000	000	020	010	020	080
1988	0	0	0	0	0	1	0	0	0	1	2	1	5
	000	000	000	000	000	010	000	000	000	010	110	010	140
1989	0	0	0	0	1	1	0	0	0	0	1	0	3
	000	000	000	000	010	010	000	000	000	000	100	000	120
1990	0	0	0	1	1	0	0	0	0	0	1	1	4
	000	000	000	001	100	000	000	000	000	000	001	010	112
1991	1	0	0	1	0	1	0	0	0	0	1	0	4
	010	000	000	100	000	010	000	000	000	000	100	000	220
1992	0	0	0	0	1	2	1	0	1	3	3	2	13
	000	000	000	000	100	020	010	000	001	021	210	020	382
1993	0	0	0	0	0	0	0	0	0	0	2	0	2
	000	000	000	000	000	000	000	000	000	000	200	000	200
1994	0	0	1	1	0	1	0	0	0	1	1	0	5
	000	000	010	100	000	010	000	000	000	010	010	000	140
1995	0	0	0	0	0	0	0	0	1	1	2	0	4
	000	000	000	000	000	000	000	000	010	010	200	000	220
1996	0	0	0	0	1	3	0	0	0	2	2	0	8
	000	000	000	000	010	120	000	000	000	110	200	000	440
1997	0	0	0	0	1	0	0	0	1	1	1	0	4
	000	000	000	000	100	000	000	000	100	010	010	000	220
1998	0	0	0	0	2	1	0	0	1	1	2	1	8
	000	000	000	000	110	100	000	000	010	010	200	100	530
1999	0	1	0	0	1	1	0	0	0	2	0	0	5
	000	010	000	000	100	010	000	000	000	200	000	000	320
2000	0	0	0	0	0	0	0	0	0	2	1	1	4
	000	000	000	000	000	000	000	000	000	020	100	010	130
2001	0	0	0	0	1	0	0	0	1	1	1	0	4
	000	000	000	000	100	000	000	000	010	010	001	000	121
2002	0	0	0	0	2	0	0	0	0	0	2	1	5
	000	000	000	000	020	000	000	000	000	000	020	010	050
2003	0	0	0	0	1	0	0	0	0	0	1	1	3
	000	000	000	000	100	000	000	000	000	000	100	010	210
2004	0	0	0	0	2	0	0	0	0	2	1	0	5
	000	000	000	000	020	000	000	000	000	020	100	000	140
2005	2	0	0	0	0	0	0	0	0	2	1	2	7
	011	000	000	000	000	000	000	000	000	020	010	020	061
2006	1	0	0	1	0	0	1	0	2	0	1	0	6
	010	000	000	100	000	000	010	000	020	000	010	000	150
(1975-2006)													

MEAN	0.2	0.1	0	0.2	0.7	0.5	0.1	0	0.3	1.0	1.3	0.6	5.0
CASES	6	2	1	5	23	17	2	1	11	32	42	18	160

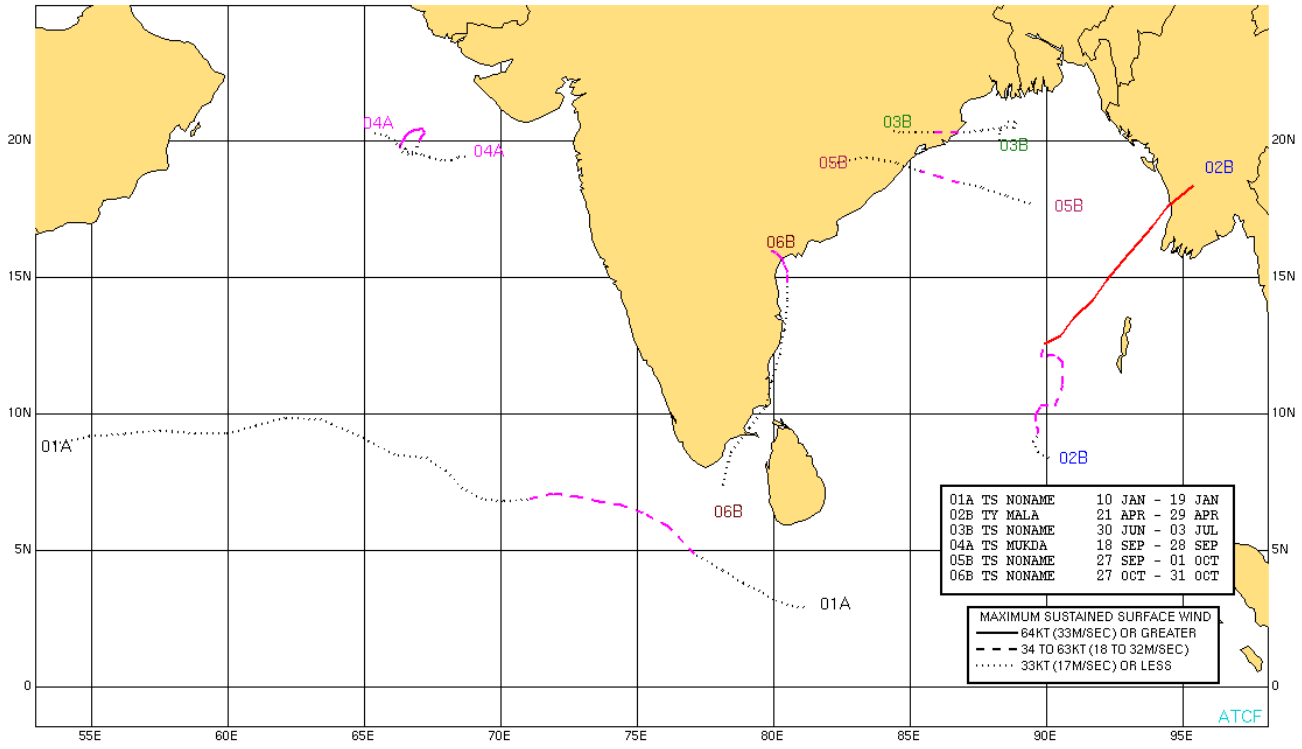
The criteria used in TABLE 1-6 are as follows:

1) If a tropical cyclone was first warned on during the last two days of a particular month and continued into the next month for longer than two days, then that system was attributed to the second month.

2) If a tropical cyclone was warned on prior to the last two days of a month, it was attributed to the first month, regardless of how long the system lasted.

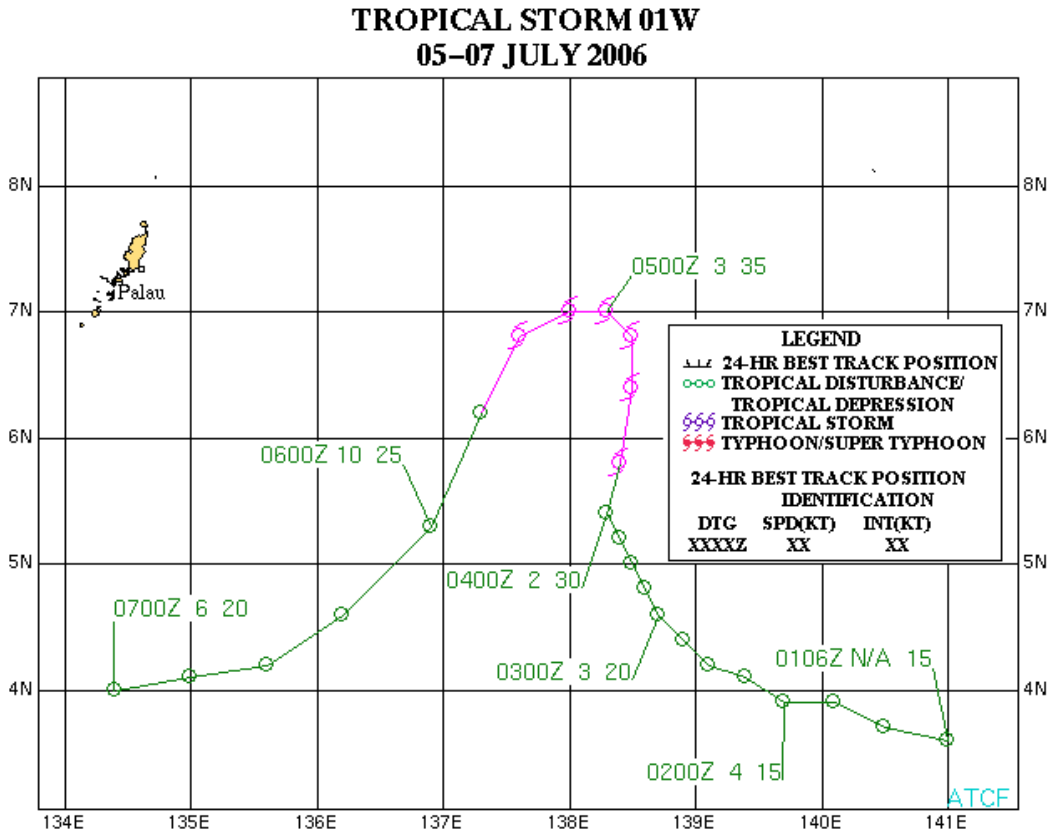
3) If a tropical cyclone began on the last day of the month and ended on the first day of the next month, that system was attributed to the first month. However, if a tropical cyclone began on the last day of the month and continued into the next month for only two days, then it was attributed to the second month.

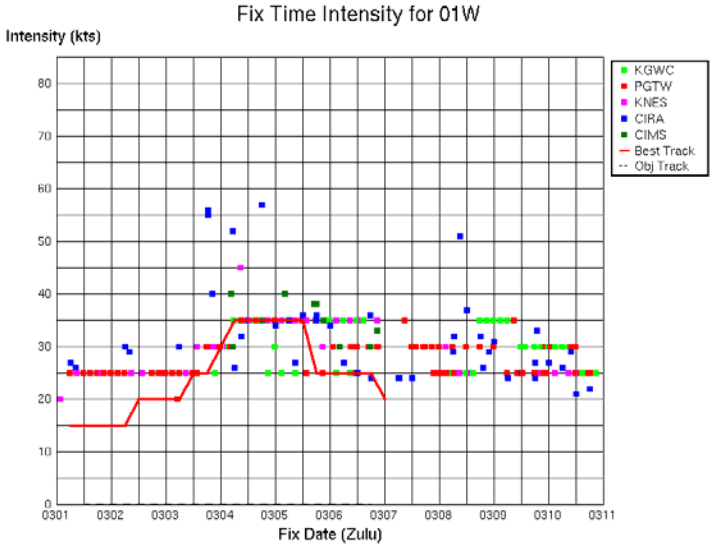
Table 1-6 Legend:		
Total month/year		
GTE 64 knots	33 to 63 knots	LTE 33 knots



TROPICAL STORM (TS) 01W

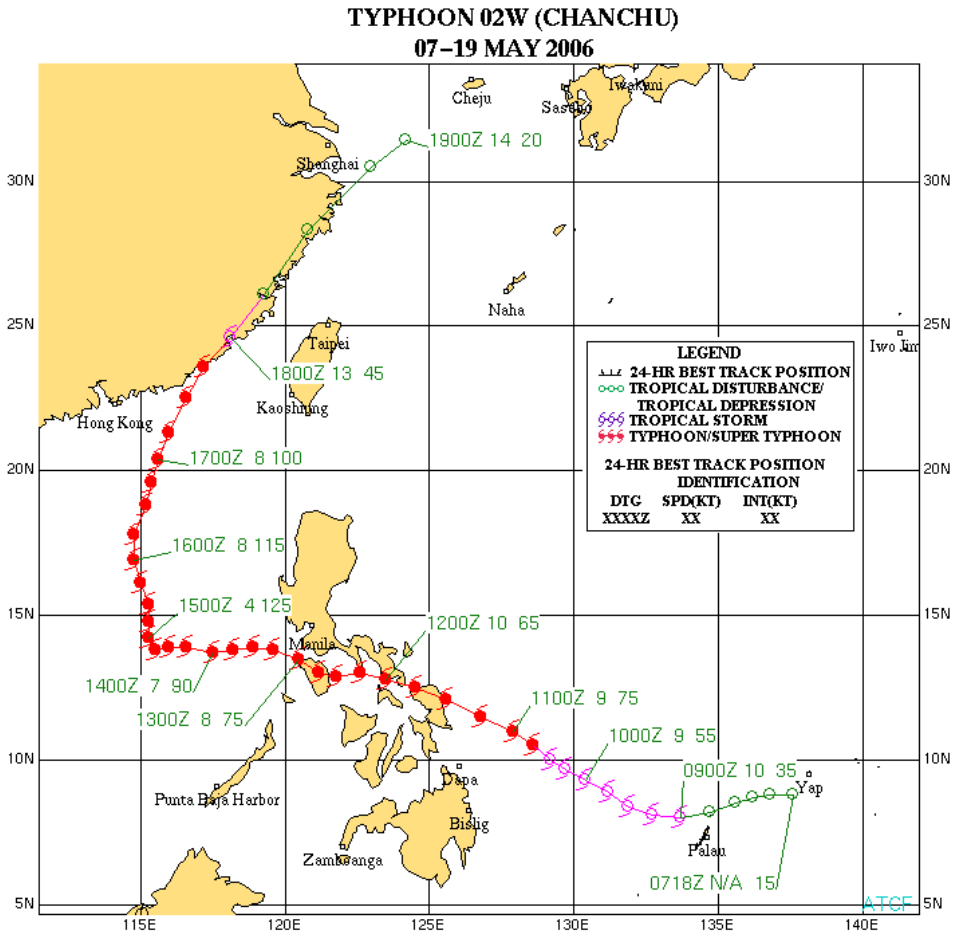
First Poor: 010600Z MAR 06
First Fair: N/A
First TCFA: 032030Z MAR 06
First Warning: 040000Z MAR 06
Last Warning: 070300Z MAR 06
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 13

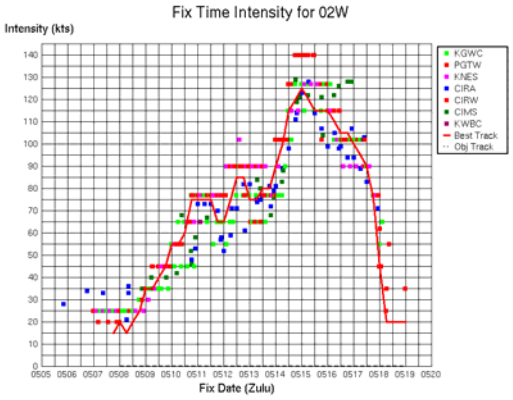




TYPHOON (TY) 02W (CHANCHU)

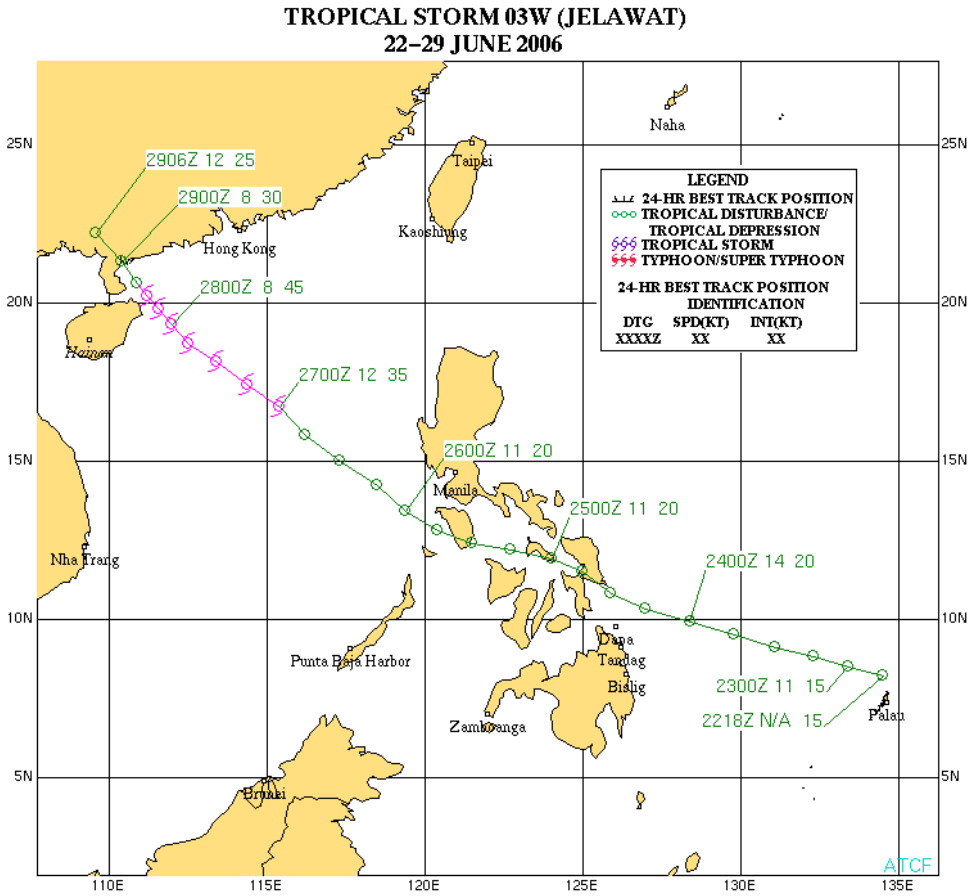
First Poor: 052030Z MAY 06
First Fair: 070130Z MAY 06
First TCFA: 081100Z MAY 06
First Warning: 081800Z MAY 06
Last Warning: 180000Z MAY 06
Max Intensity: 125 kts, gusts to 150 kts
Total Warnings: 38

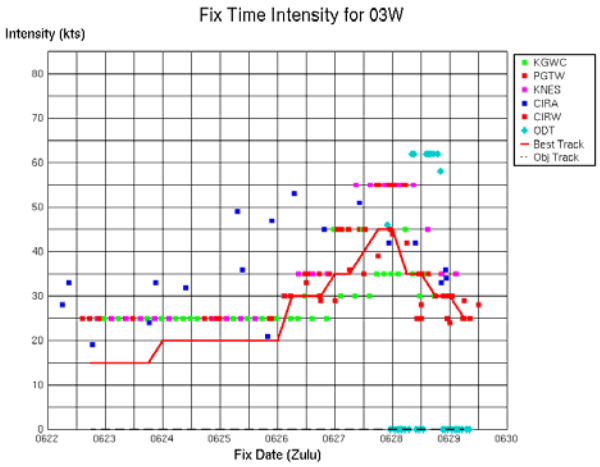




TROPICAL STORM (TS) 03W (JELAWAT)

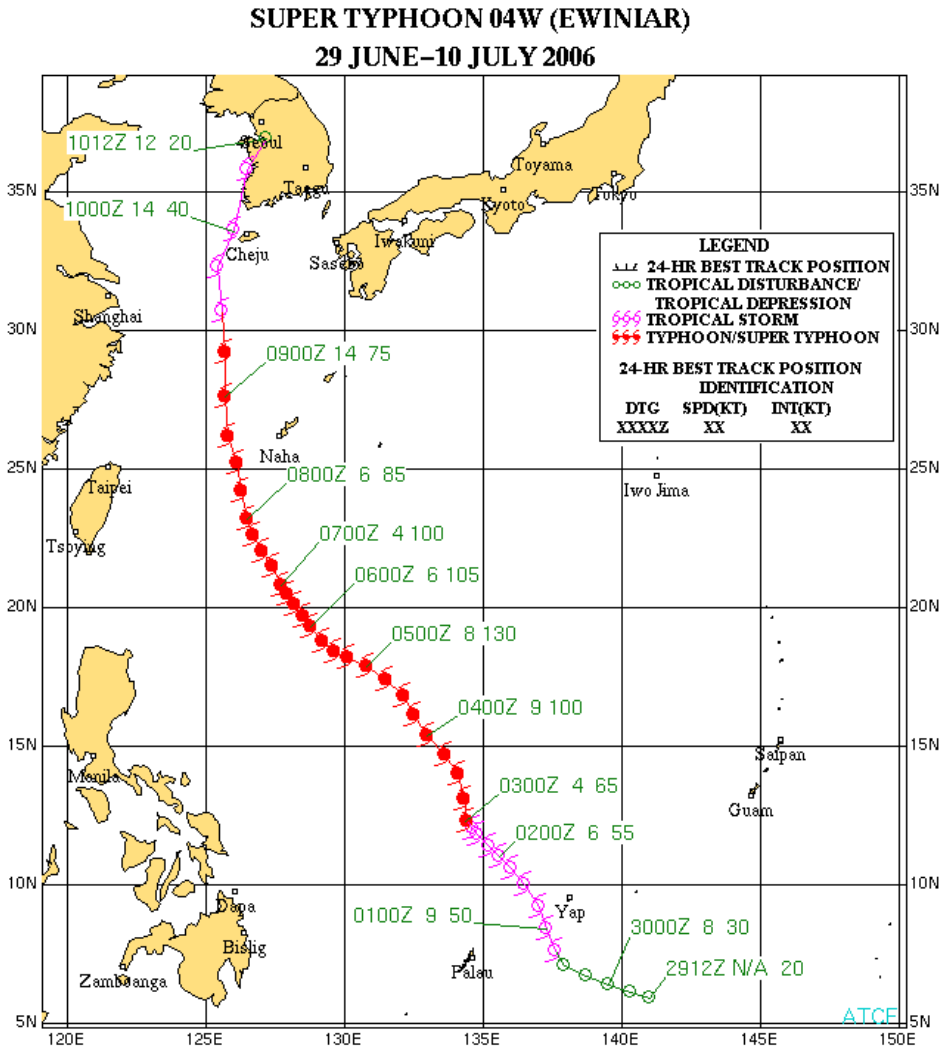
First Poor: 220600Z JUN 06
First Fair: 221930Z JUN 06
First TCFA: 252230Z JUN 06
First Warning: 260600Z JUN 06
Last Warning: 290600Z JUN 06
Max Intensity: 45 kts, gusts to 55 kts
Total Warnings: 13

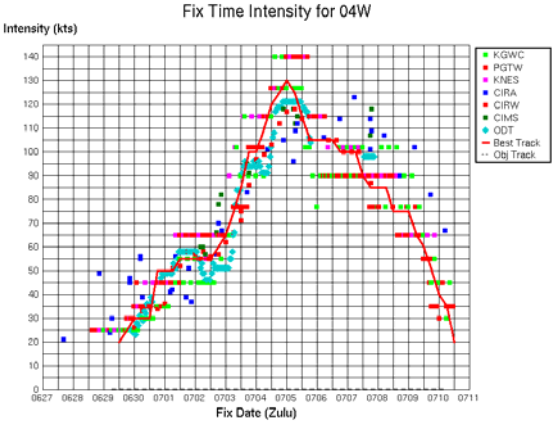




SUPER TYPHOON (STY) 04W (EWINIAR)

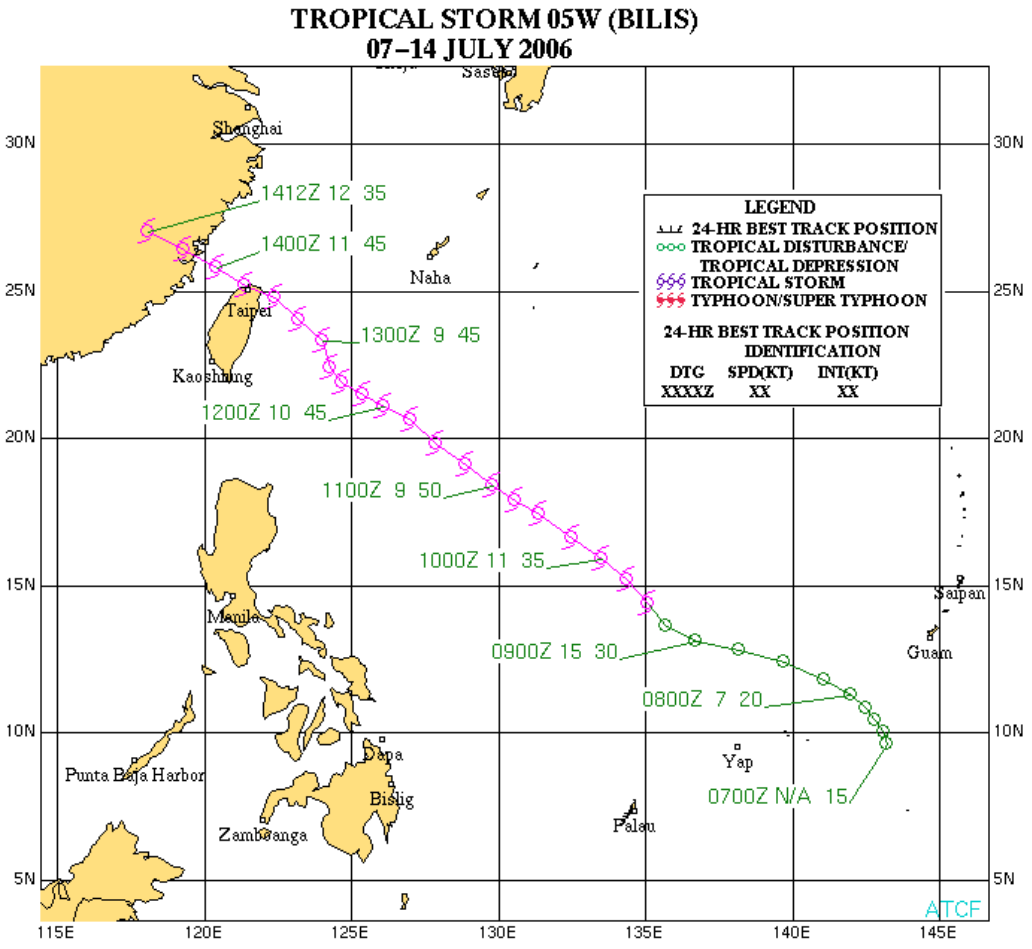
First Poor: N/A
First Fair: 281730Z JUN 06
First TCFA: 290600Z JUN 06
First Warning: 291800Z JUN 06
Last Warning: 100600Z JUL 06
Max Intensity: 130 kts, gusts to 160 kts
Total Warnings: 43

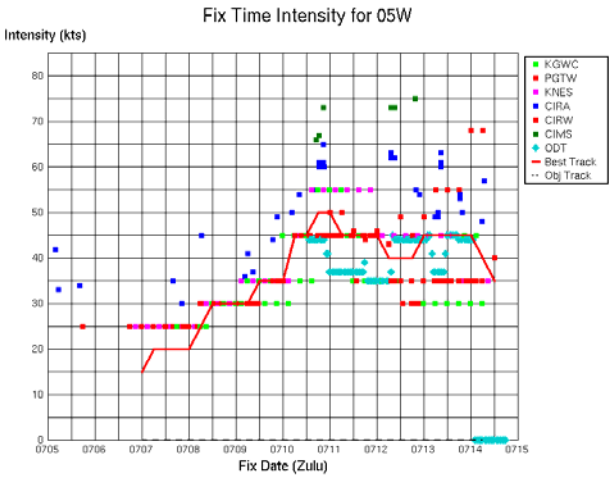




TROPICAL STORM (TS) 05W (BILIS)

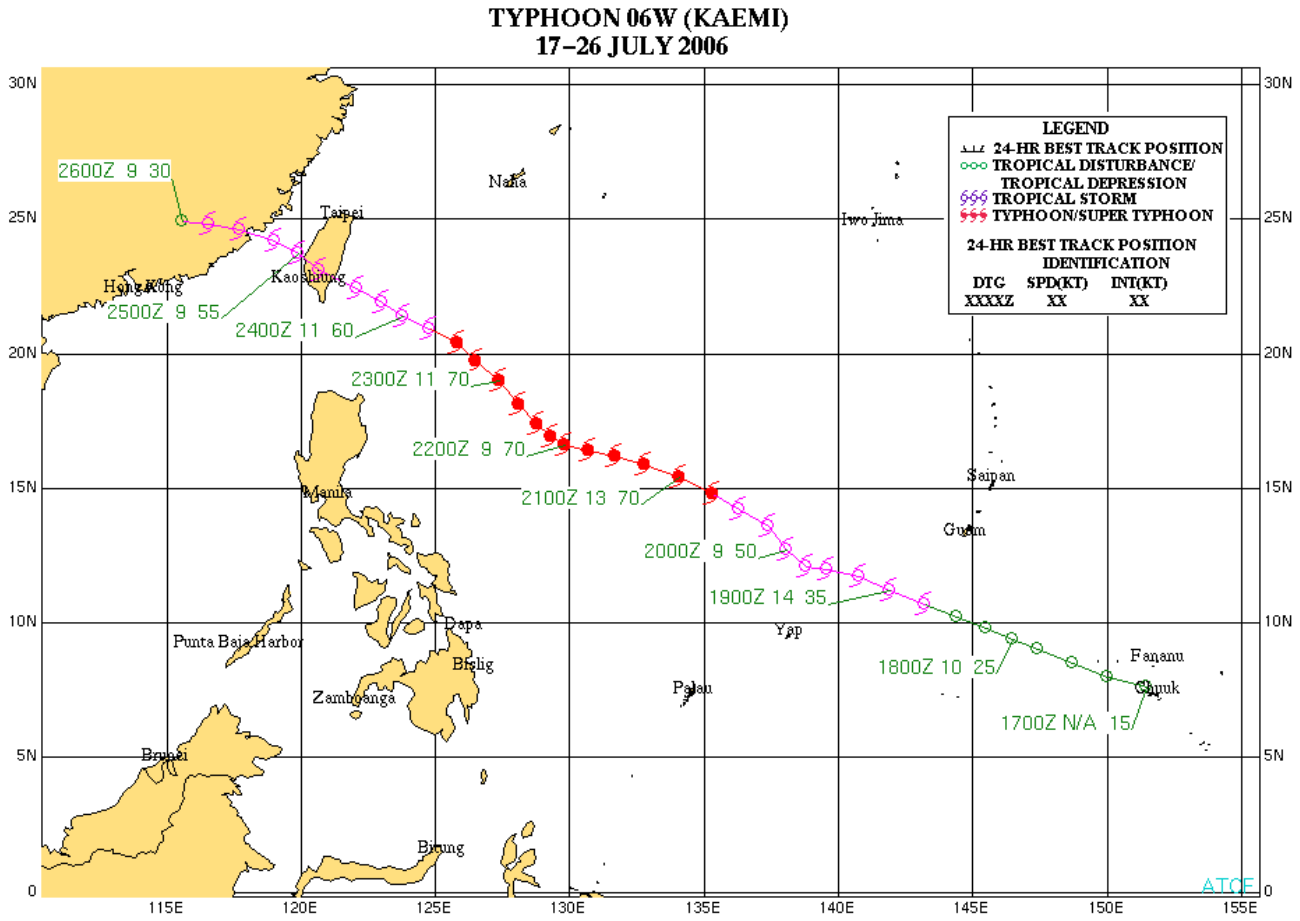
First Poor: N/A
First Fair: 050600Z JUL 06
First TCFA: 071200Z JUL 06
First Warning: 080000Z JUL 06
Last Warning: 140600Z JUL 06
Max Intensity: 50 kts, gusts to 65 kts
Total Warnings: 26

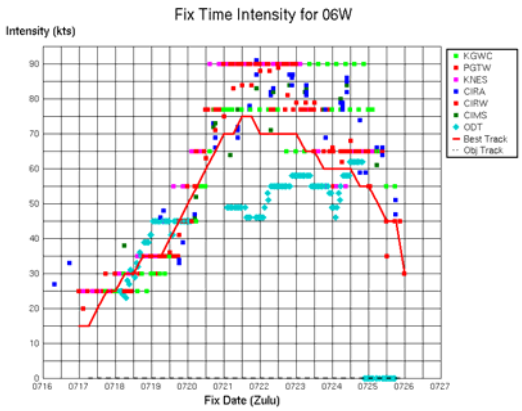




TYPHOON (TY) 06W (KAEMI)

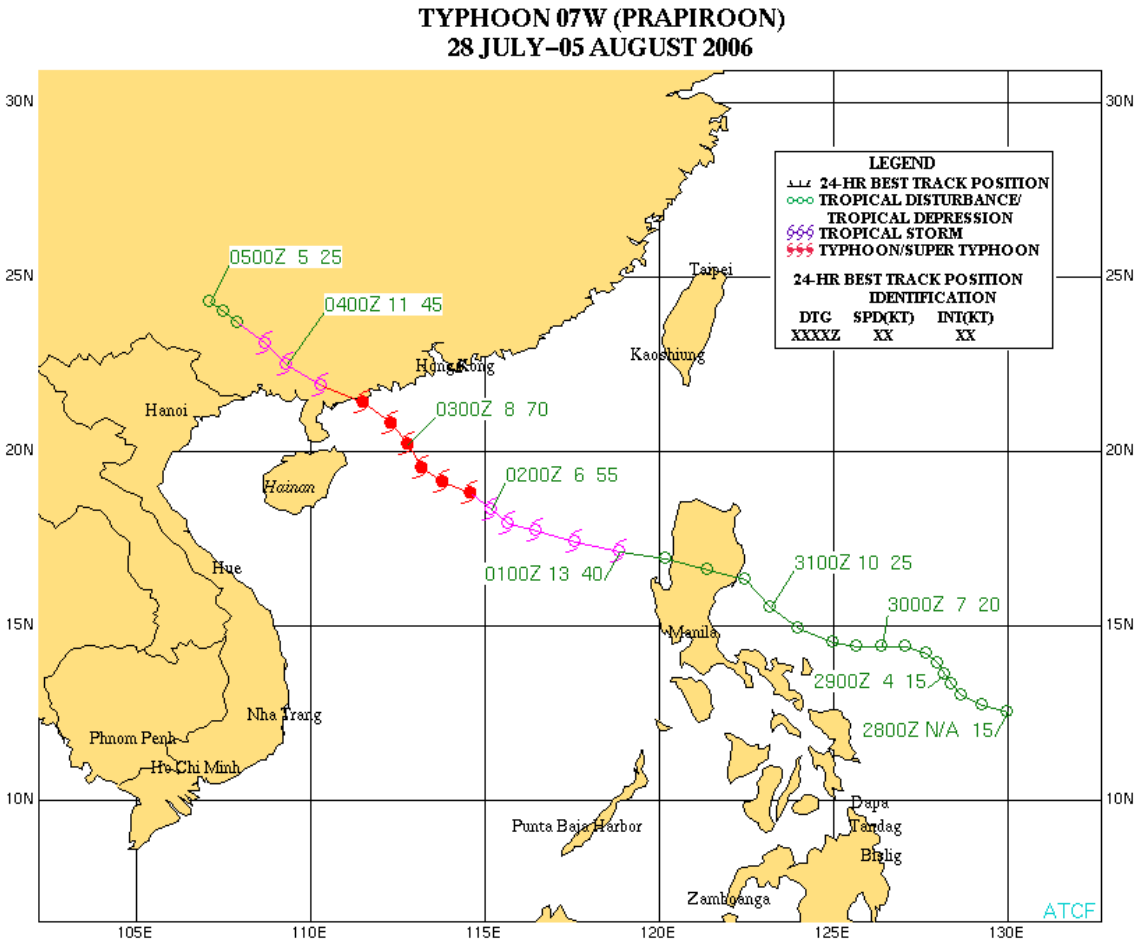
First Poor: 162200Z JUL 06
First Fair: 170600Z JUL 06
First TCFA: 171430Z JUL 06
First Warning: 180000Z JUL 06
Last Warning: 251200Z JUL 06
Max Intensity: 75 kts, gusts to 90 kts
Total Warnings: 31

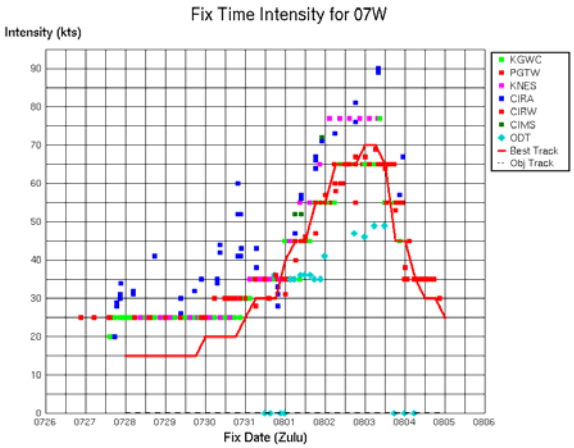




TYPHOON (TY) 07W (PRAPIROON)

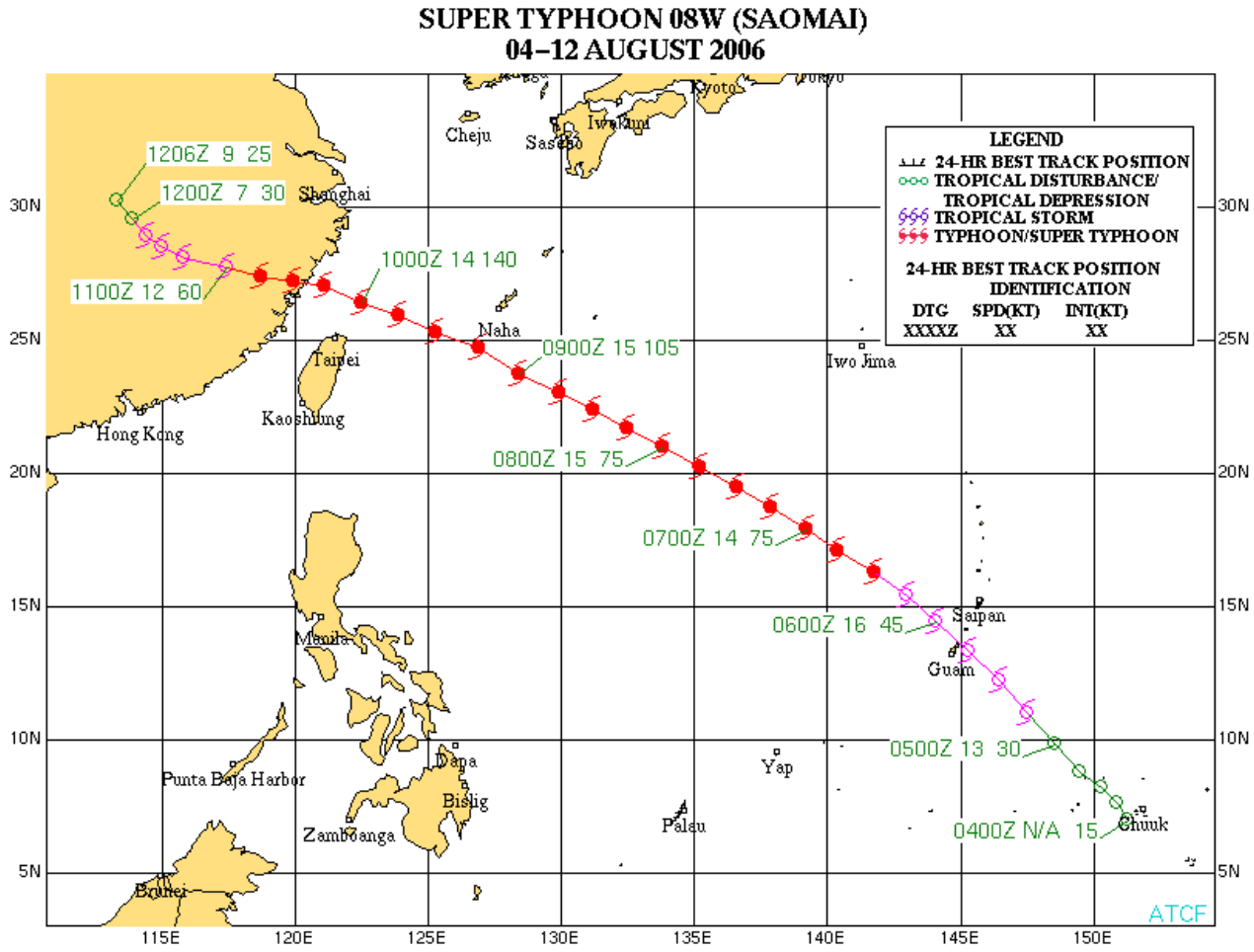
First Poor: 250600Z JUL 06
First Fair: 262200Z JUL 06
First TCFA: 300230Z JUL 06
First Warning: 310000Z JUL 06
Last Warning: 031800Z AUG 06
Max Intensity: 70 kts, gusts to 85 kts
Total Warnings: 16

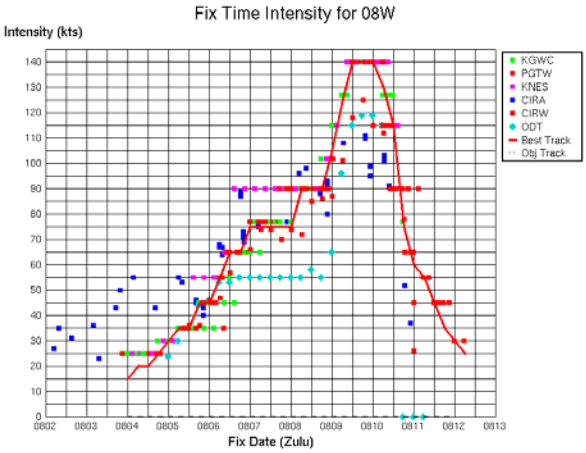




SUPER TYPHOON (STY) 08W (SAOMAI)

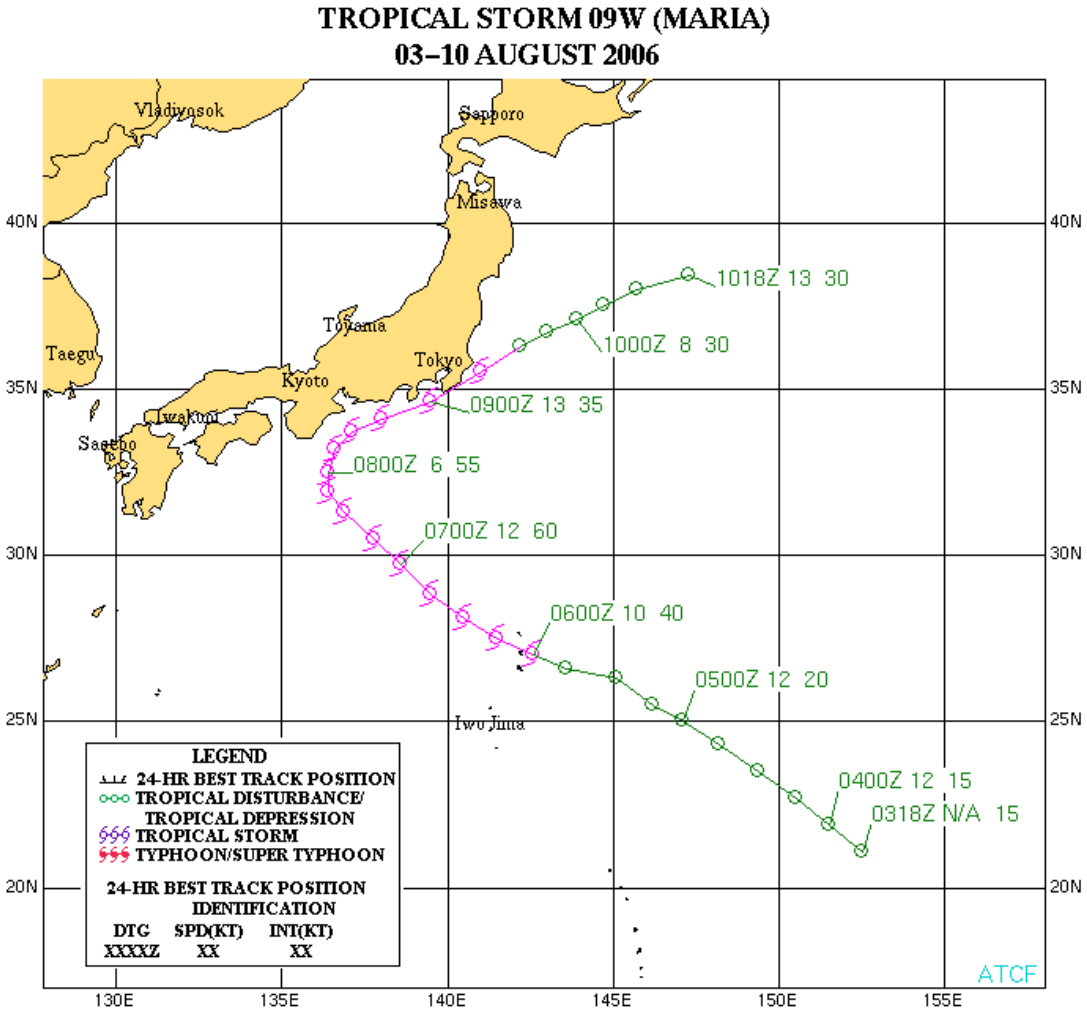
First Poor: 020600Z AUG 06
First Fair: 040600Z AUG 06
First TCFA: 041400Z AUG 06
First Warning: 041800Z AUG 06
Last Warning: 101800Z AUG 06
Max Intensity: 140 kts, gusts to 170 kts
Total Warnings: 25

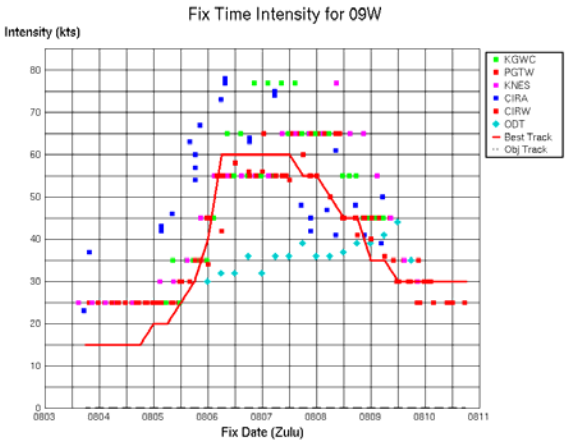




TROPICAL STORM (TS) 09W (MARIA)

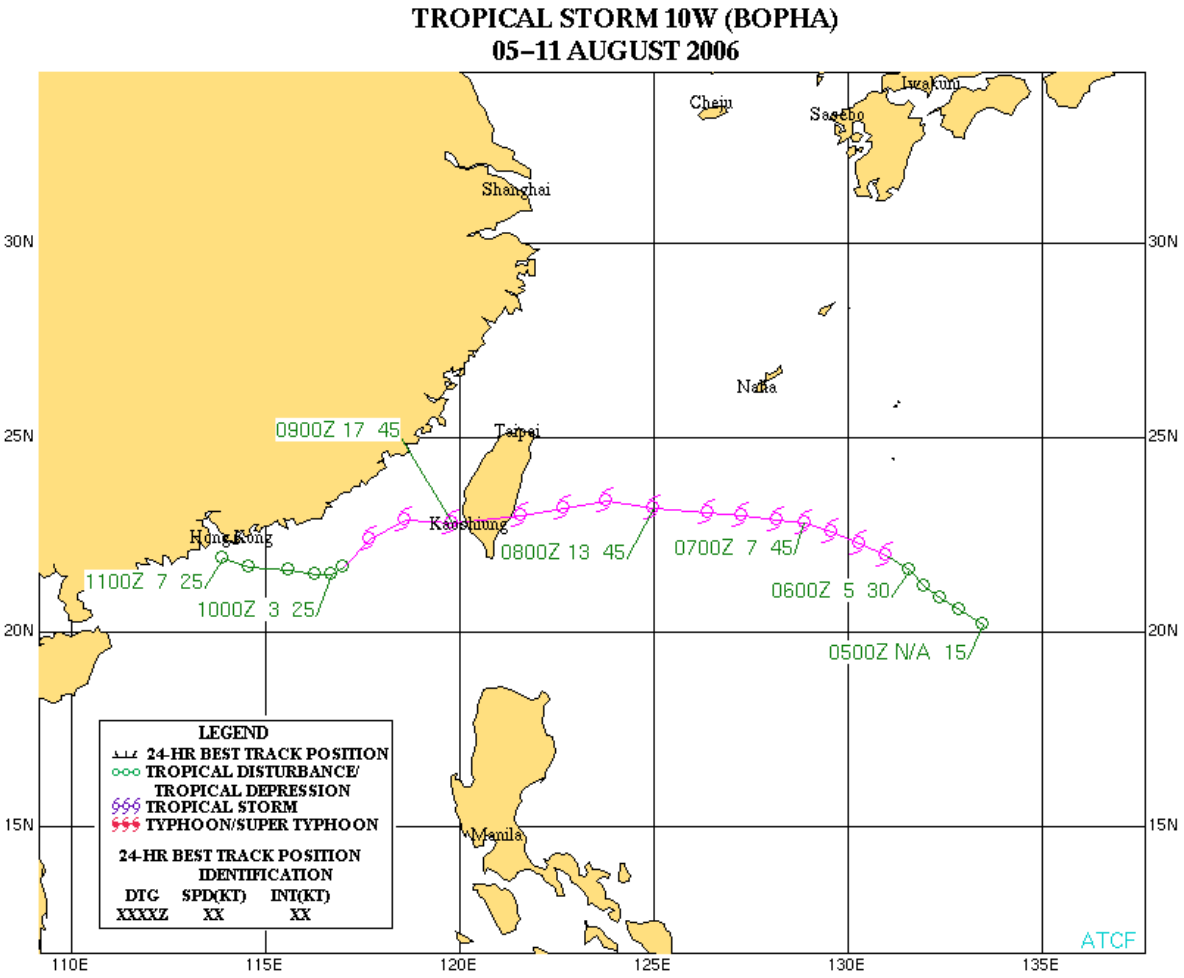
First Poor: 032330Z AUG 06
First Fair: 042200Z AUG 06
First TCFA: 051630Z AUG 06
First Warning: 051800Z AUG 06
Last Warning: 090000Z AUG 06
Max Intensity: 60 kts, gusts to 75 kts
Total Warnings: 14

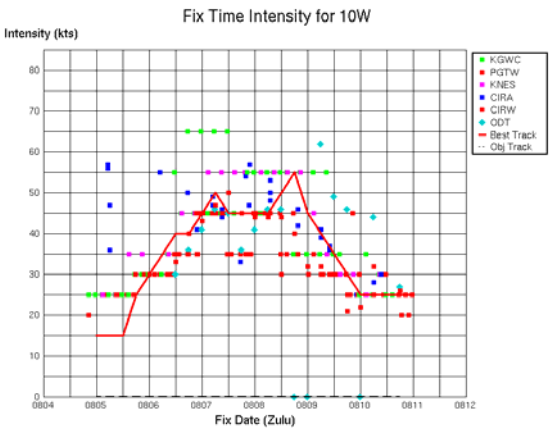




TROPICAL STORM (TS) 10W (BOPHA)

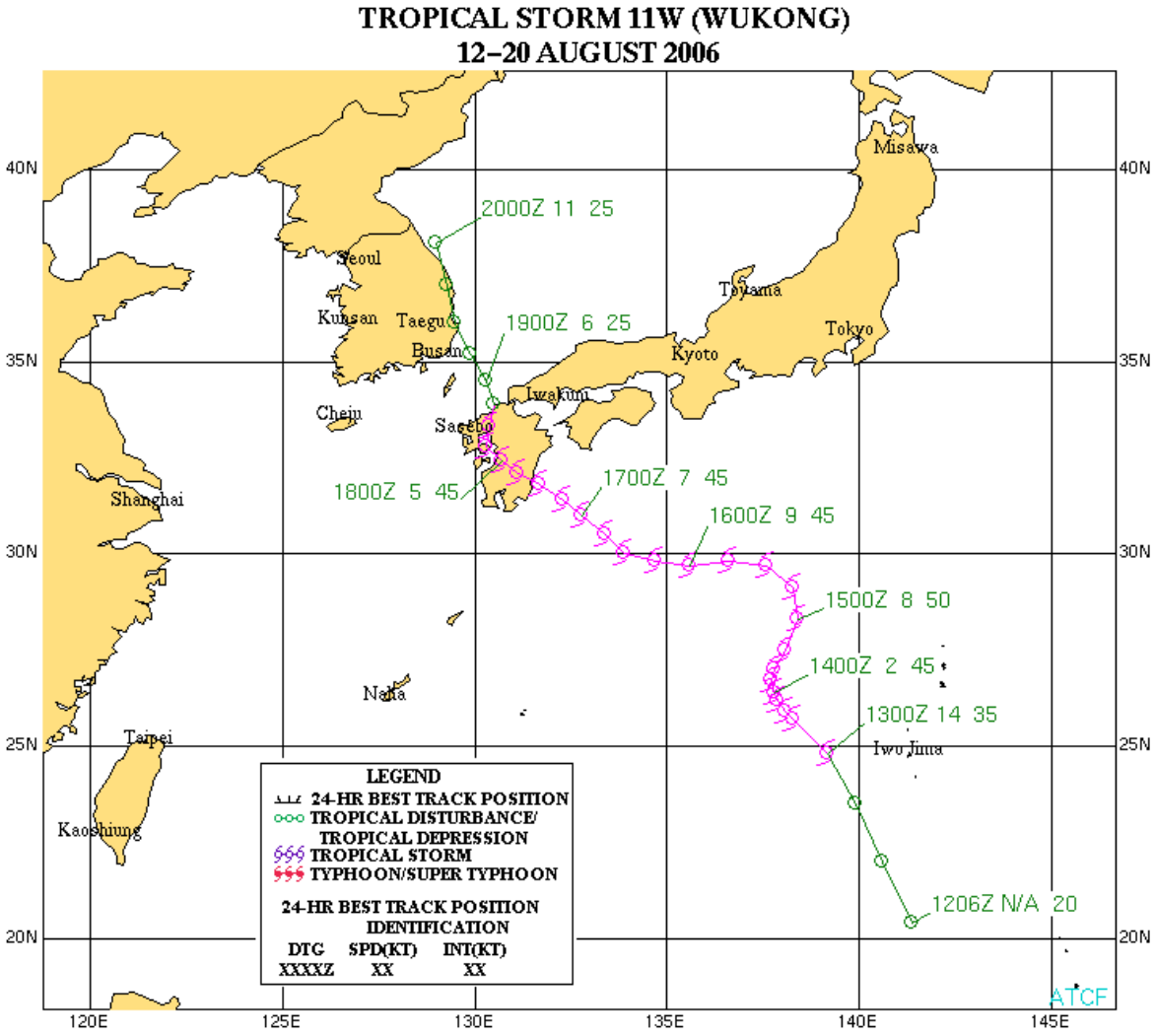
First Poor: 042200Z AUG 06
First Fair: 050600Z AUG 06
First TCFA: N/A
First Warning: 060600Z AUG 06
Last Warning: 101200Z AUG 06
Max Intensity: 55 kts, gusts to 70 kts
Total Warnings: 18

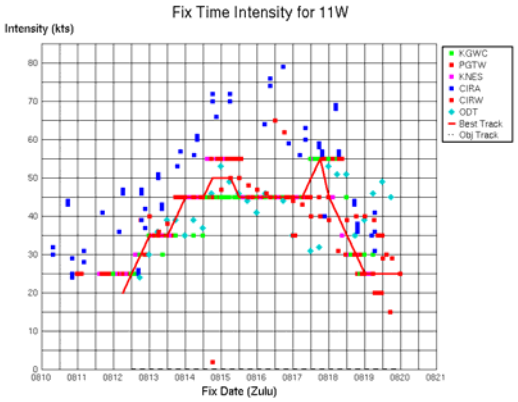




TROPICAL STORM (TS) 11W (WUKONG)

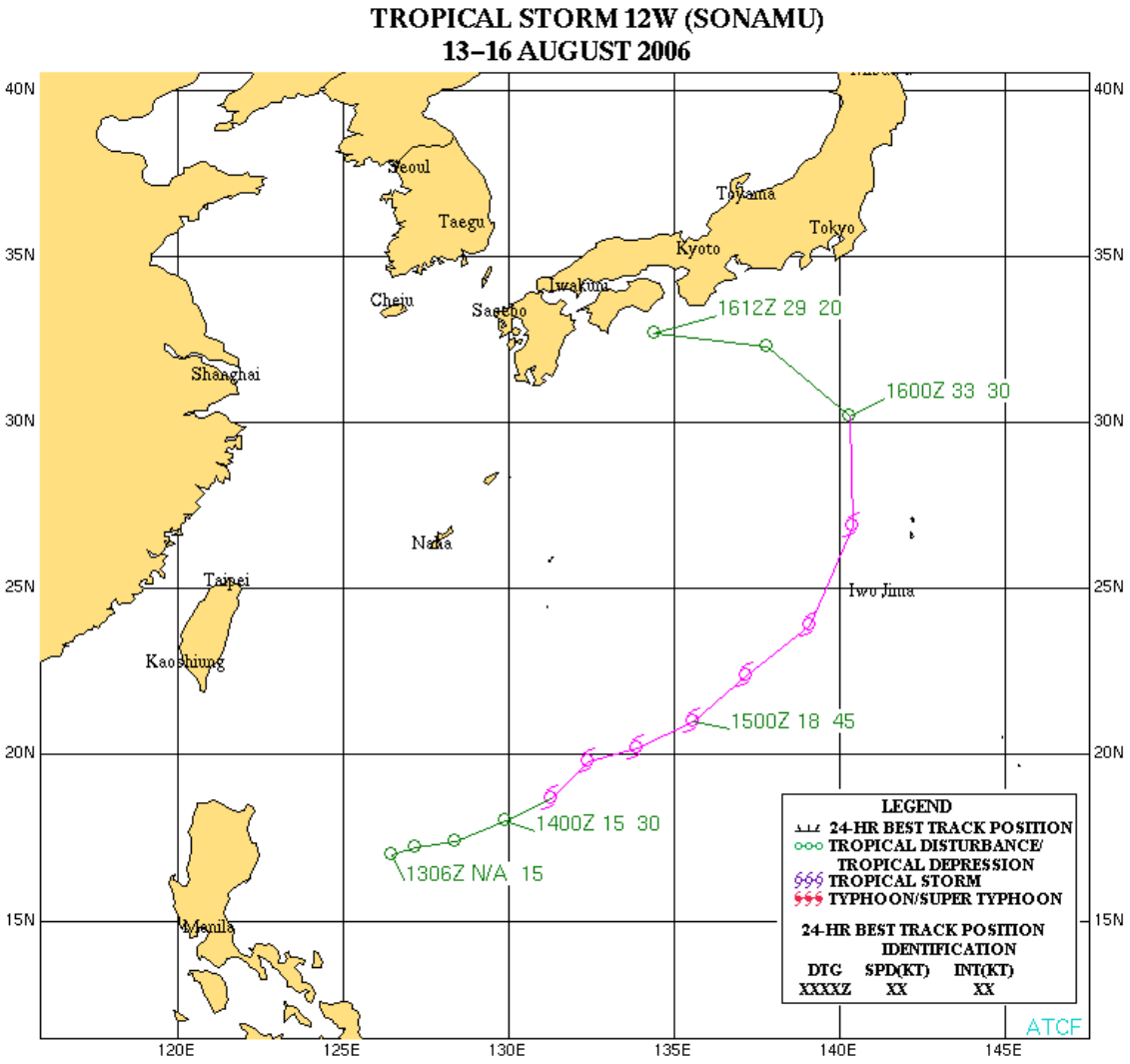
First Poor: N/A
First Fair: 092300Z AUG 06
First TCFA: 120230Z AUG 06
First Warning: 121200Z AUG 06
Last Warning: 190000Z AUG 06
Max Intensity: 55 kts, gusts to 70 kts
Total Warnings: 27

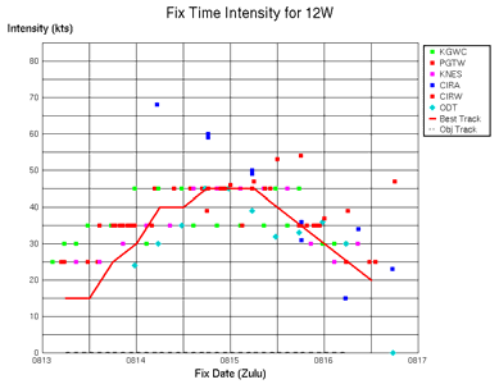




TROPICAL STORM (TS) 12W (SONAMU)

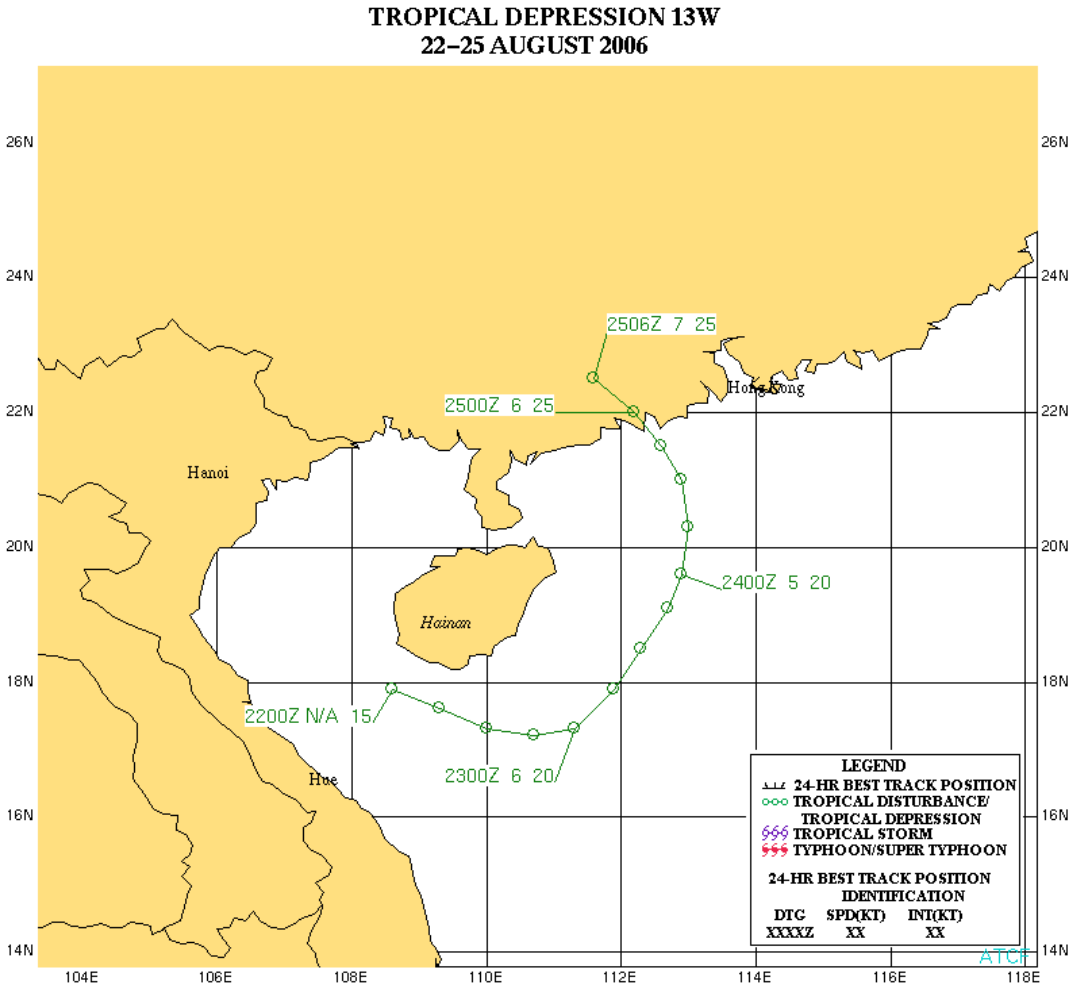
First Poor: 130600Z AUG 06
First Fair: N/A
First TCFA: 131730Z AUG 06
First Warning: 131800Z AUG 06
Last Warning: 160000Z AUG 06
Max Intensity: 45 kts, gusts to 55 kts
Total Warnings: 10

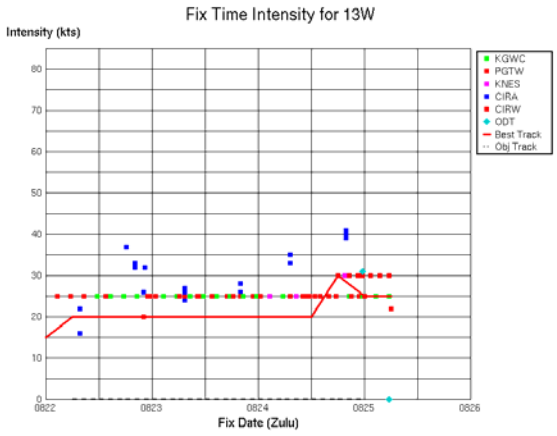




TROPICAL DEPRESSION (TD) 13W

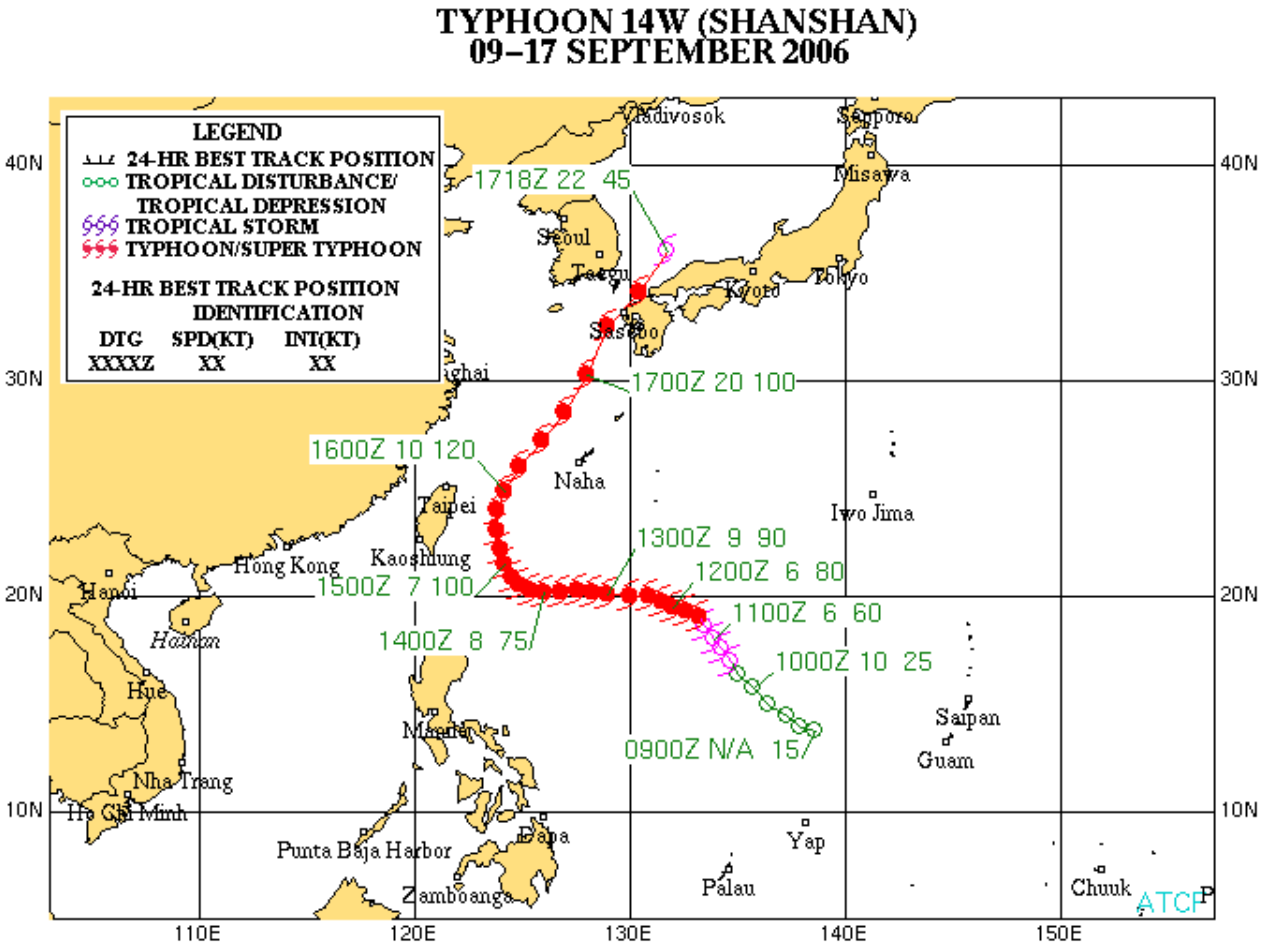
First Poor: N/A
First Fair: 220600Z AUG 06
First TCFA: 230200Z AUG 06
First Warning: 241800Z AUG 06
Last Warning: 250000Z AUG 06
Max Intensity: 30 kts, gusts to 40 kts
Total Warnings: 2

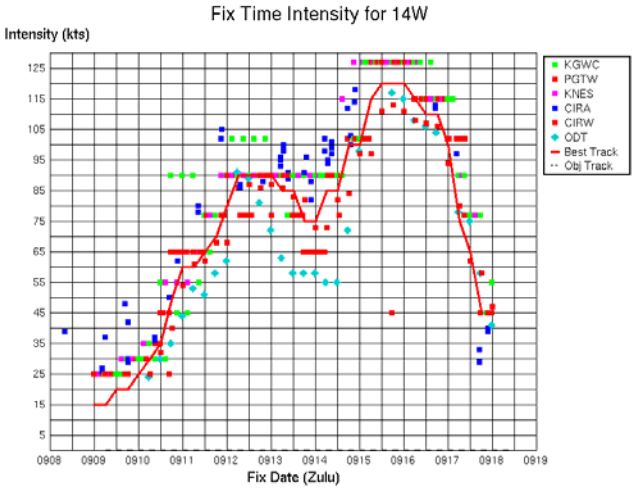




TYPHOON (TY) 14W (SHANSHAN)

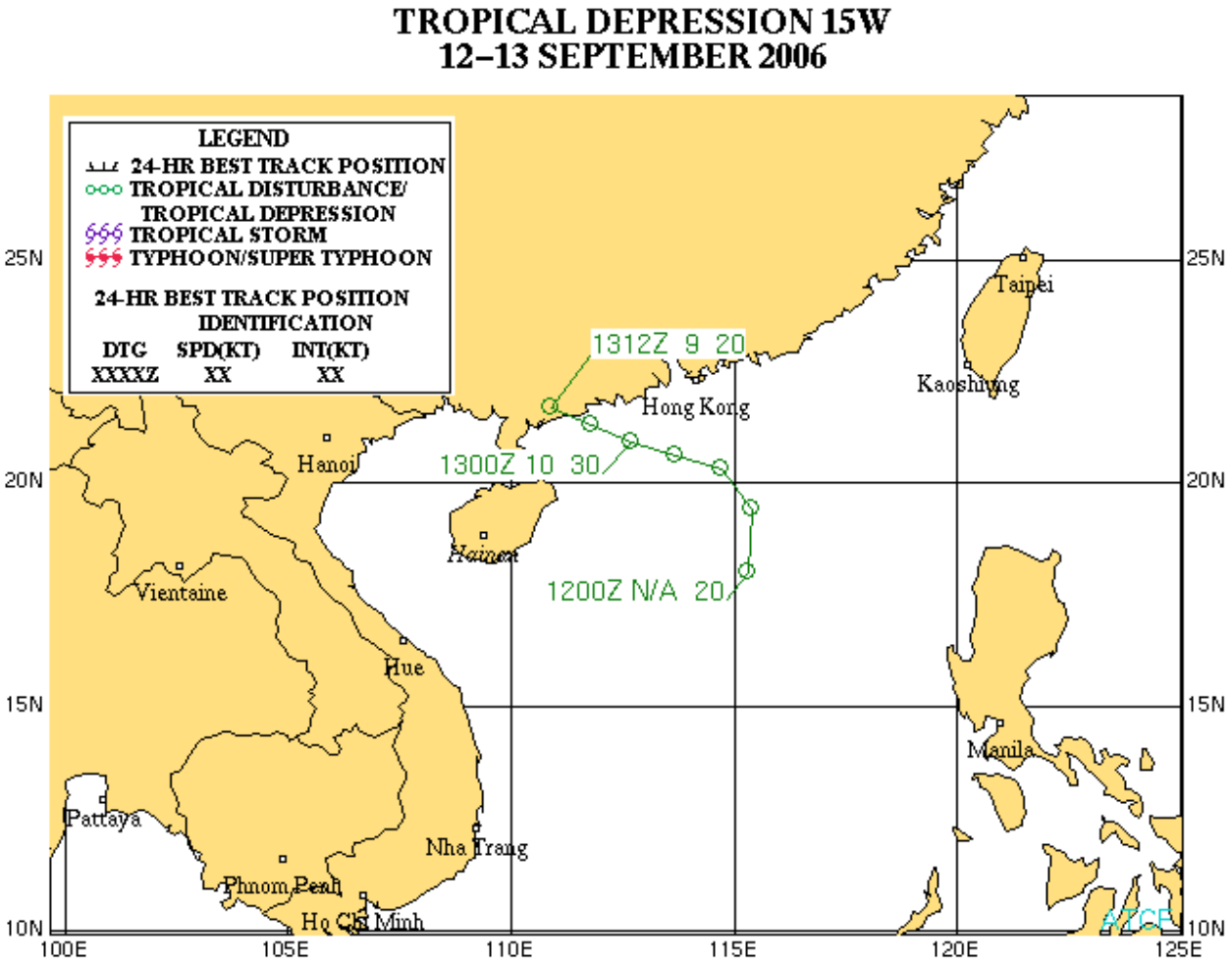
First Poor: 081000Z SEP 06
First Fair: 090200Z SEP 06
First TCFA: 091230Z SEP 06
First Warning: 100000Z SEP 06
Last Warning: 171800Z SEP 06
Max Intensity: 120 kts, gusts to 145 kts
Total Warnings: 32

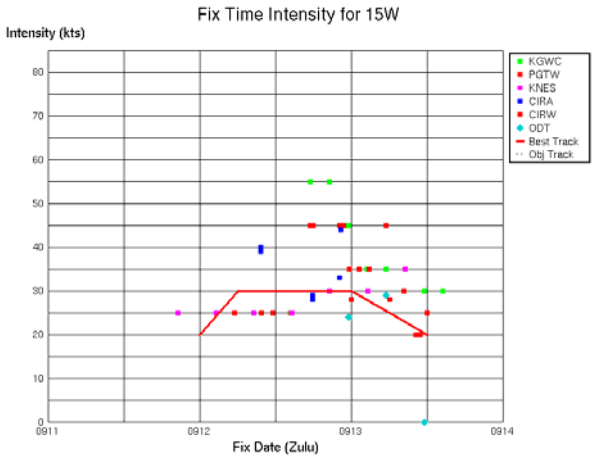




TROPICAL DEPRESSION (TD) 15W

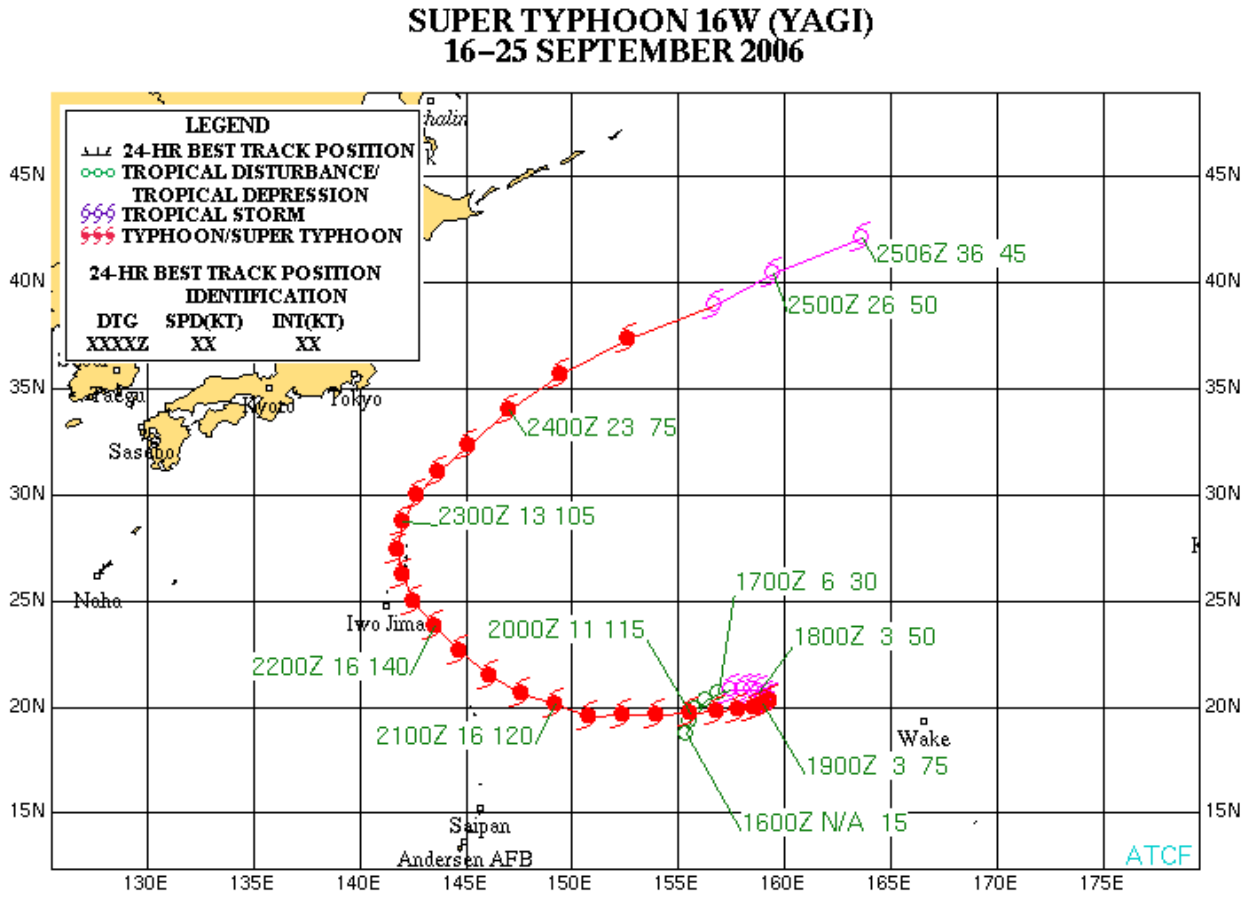
First Poor: 110600Z SEP 06
First Fair: 120600Z SEP 06
First TCFA: 121430Z SEP 06
First Warning: 121800Z SEP 06
Last Warning: 131200Z SEP 06
Max Intensity: 30 kts, gusts to 40 kts
Total Warnings: 4

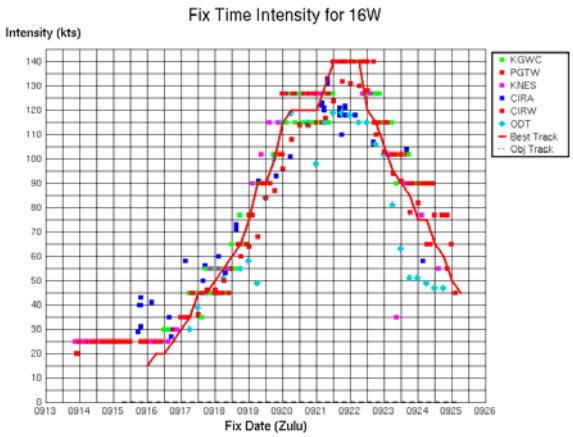




SUPER TYPHOON (STY) 16W (YAGI)

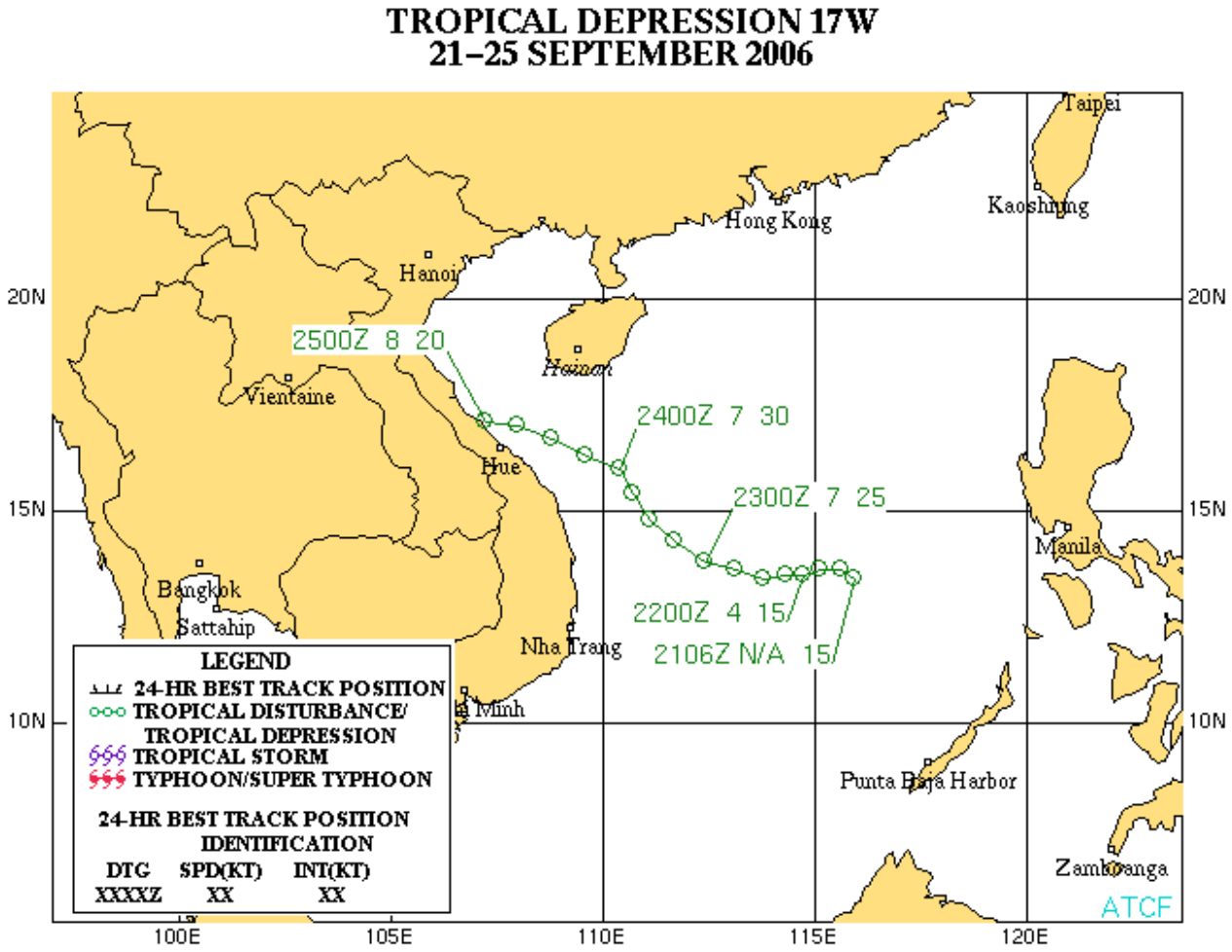
First Poor: 160000Z SEP 06
First Fair: 160600Z SEP 06
First TCFA: 161730Z SEP 06
First Warning: 170000Z SEP 06
Last Warning: 240000Z SEP 06
Max Intensity: 140 kts, gusts to 170 kts
Total Warnings: 29

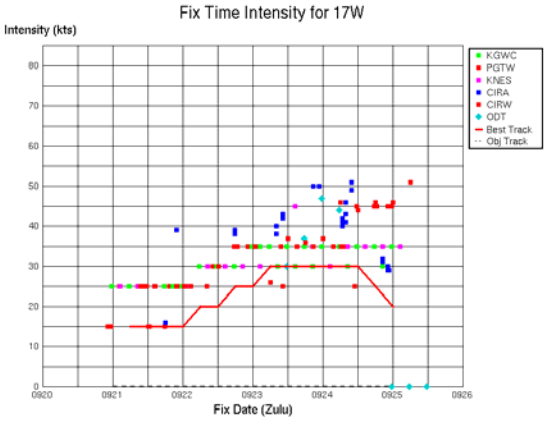




TROPICAL DEPRESSION (TD) 17W

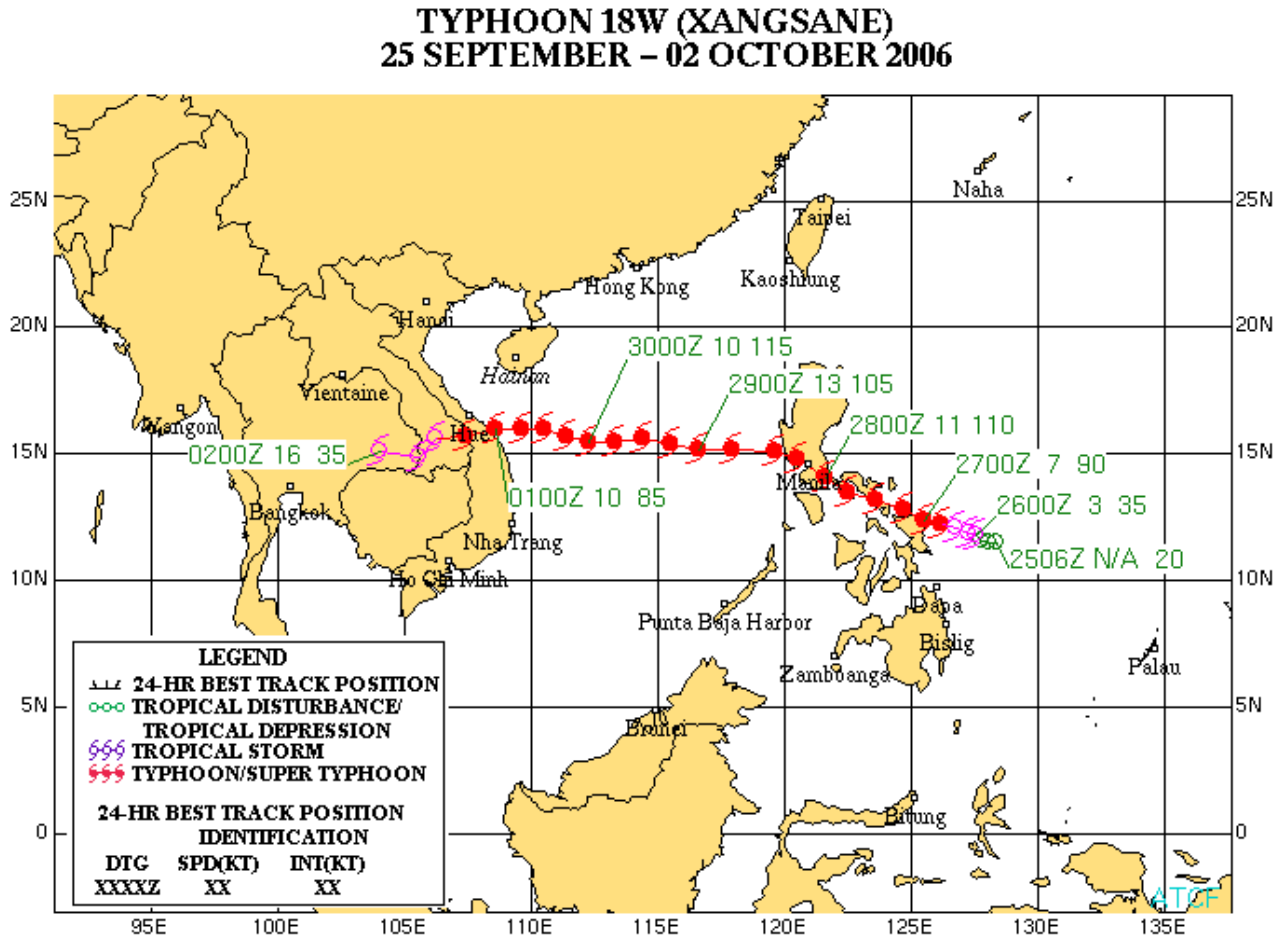
First Poor: 211700Z SEP 06
First Fair: N/A
First TCFA: 220530Z SEP 06
First Warning: 230000Z SEP 06
Last Warning: 250000Z SEP 06
Max Intensity: 30 kts, gusts to 40 kts
Total Warnings: 9

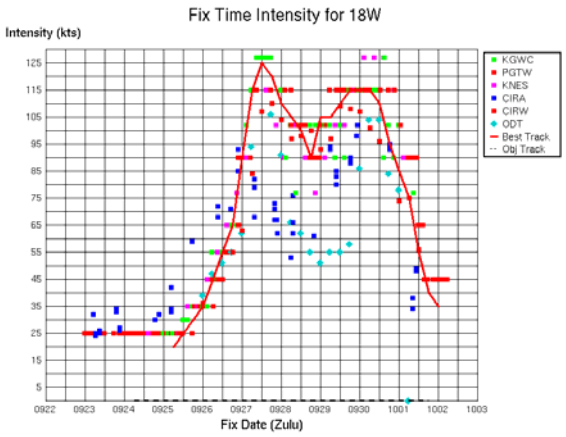




TYPHOON (TY) 18W (XANGSANE)

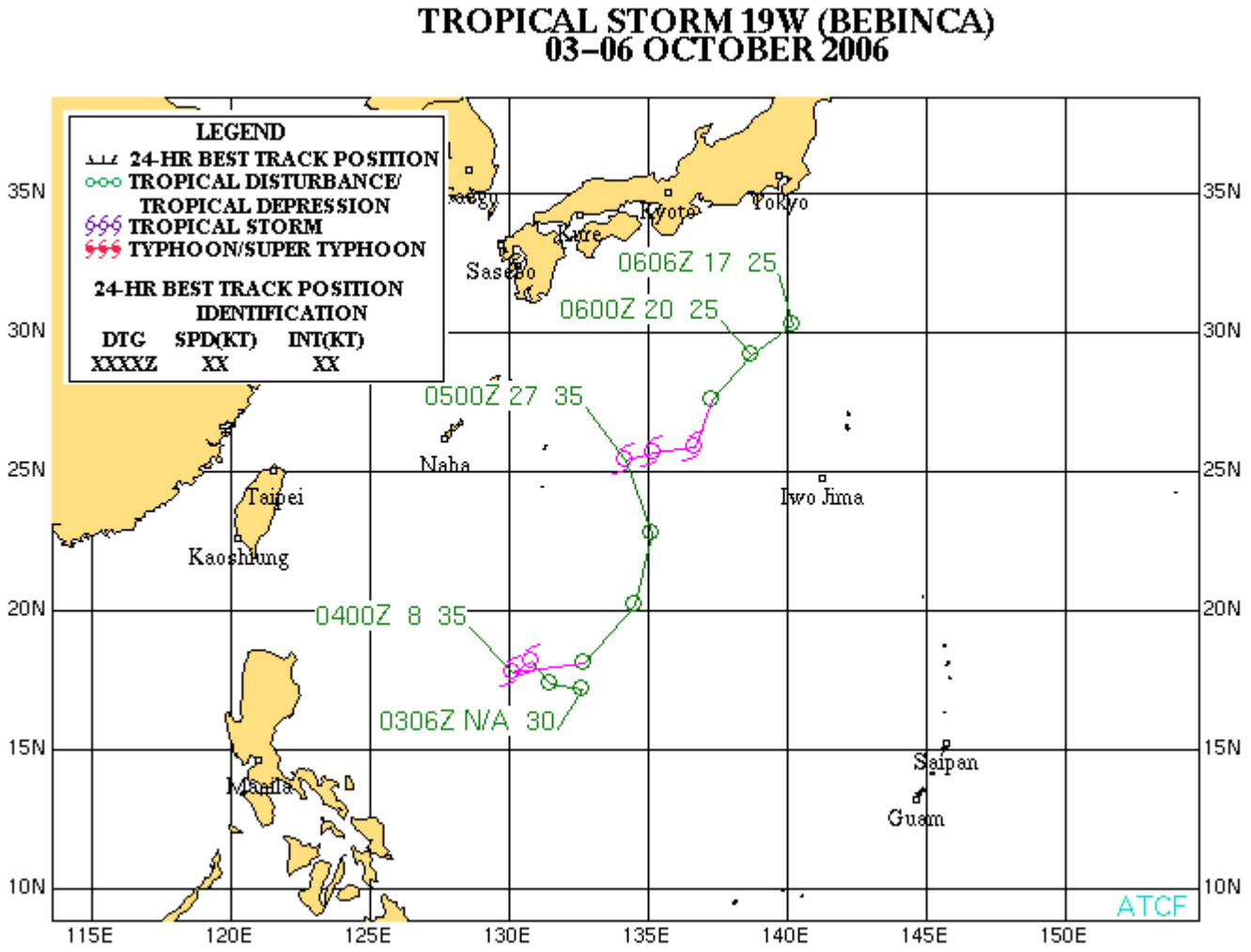
First Poor: N/A
First Fair: 242300Z SEP 06
First TCFA: 250600Z SEP 06
First Warning: 251200Z SEP 06
Last Warning: 010600Z OCT 06
Max Intensity: 125 kts, gusts to 150 kts
Total Warnings: 24

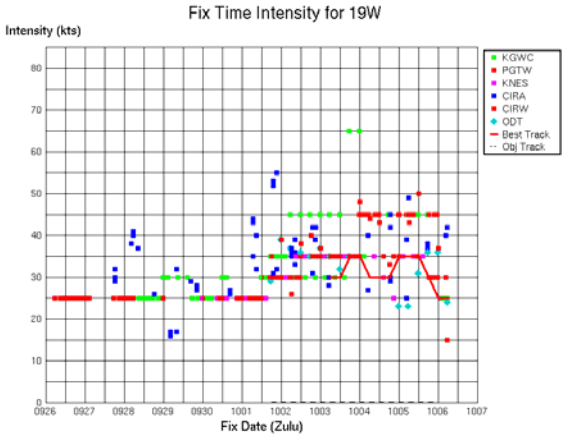




TROPICAL STORM (TS) 19W (BEBINCA)

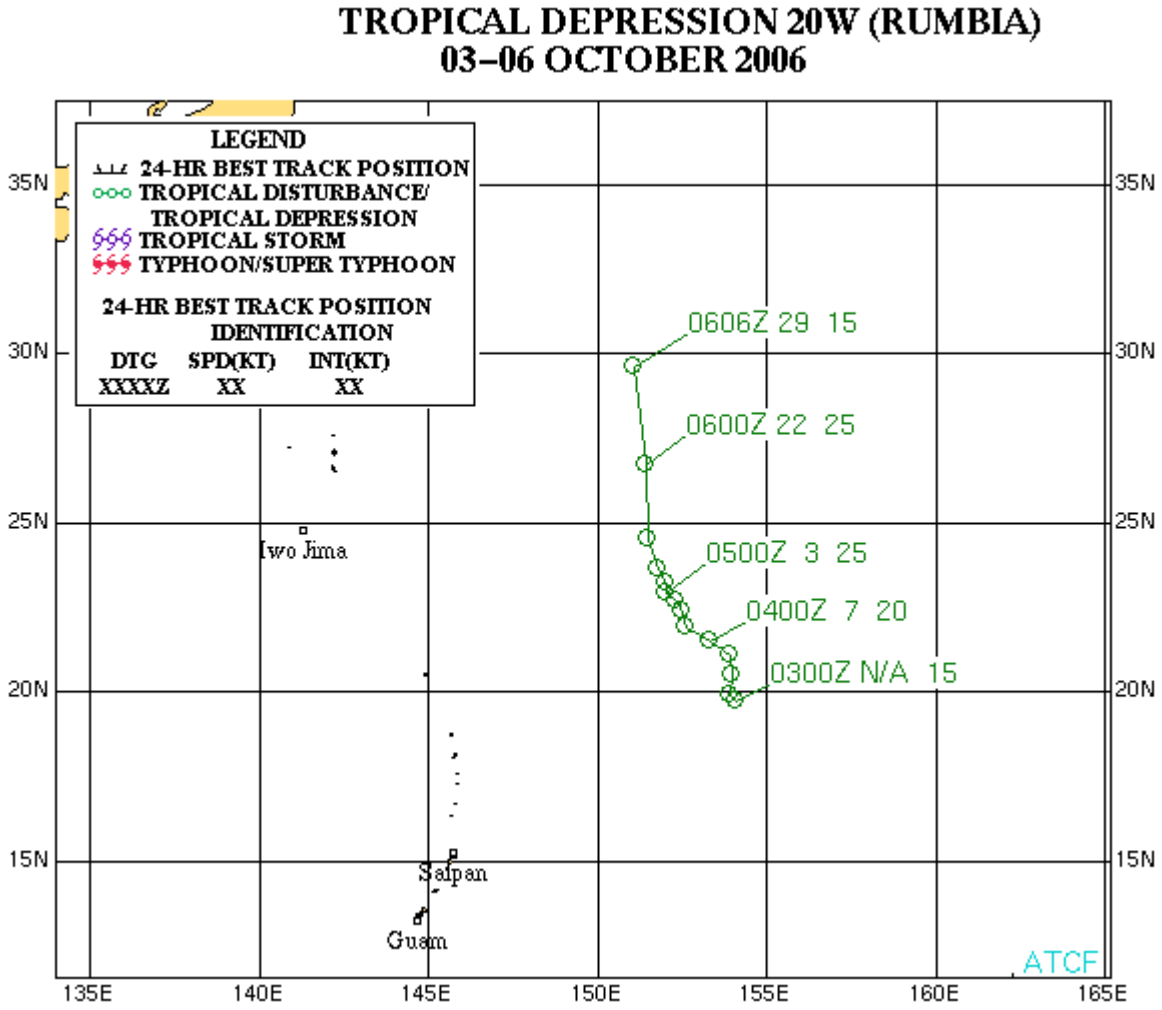
First Poor: 271730Z SEP 06
First Fair: 291500Z SEP 06
First TCFA: N/A
First Warning: 011200Z OCT 06
Last Warning: 060000Z OCT 06
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 19

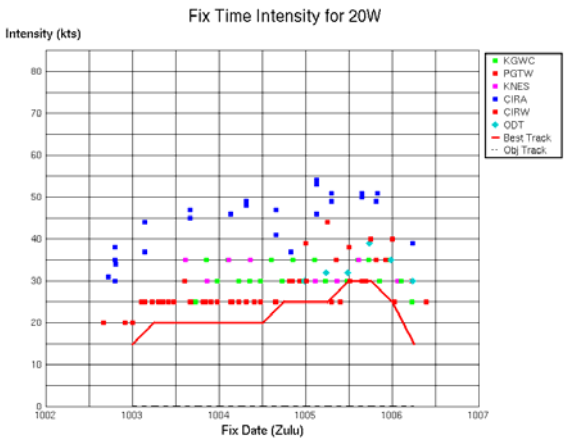




TROPICAL DEPRESSION (TD) 20W (RUMBIA)

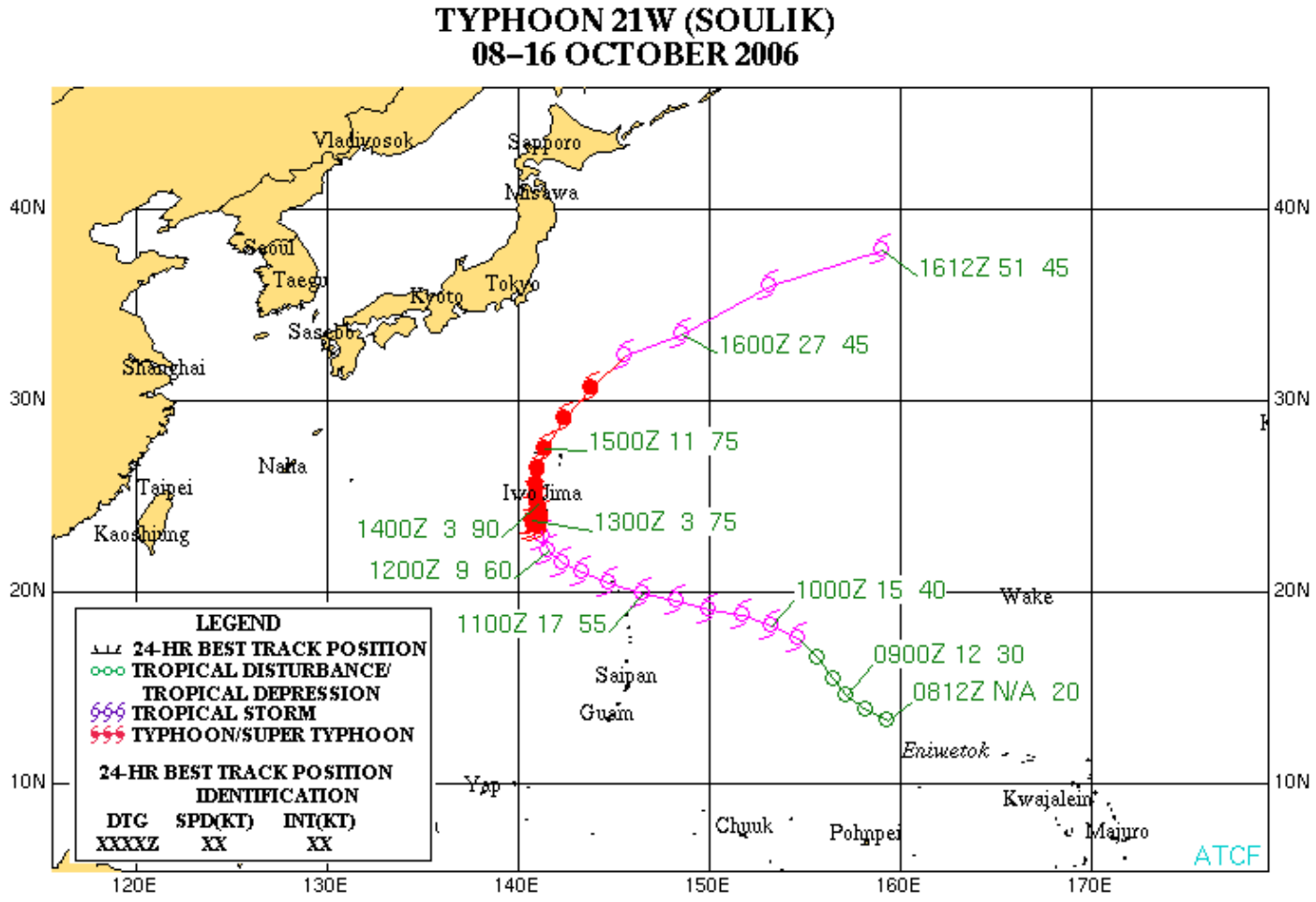
First Poor: 012130Z OCT 06
First Fair: 022000Z OCT 06
First TCFA: 031700Z OCT 06
First Warning: 041800Z OCT 06
Last Warning: 060000Z OCT 06
Max Intensity: 30 kts, gusts to 40 kts

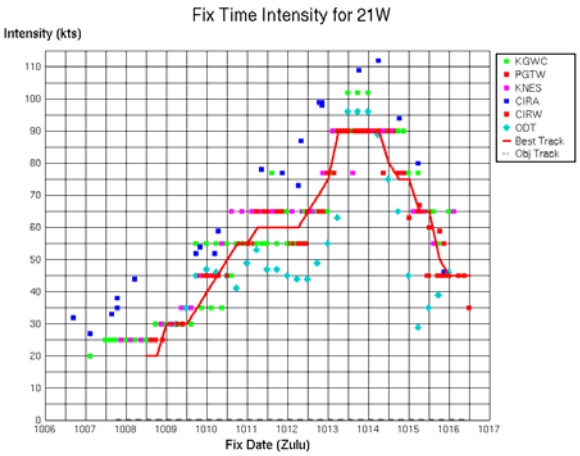




TYPHOON (TY) 21W (SOULIK)

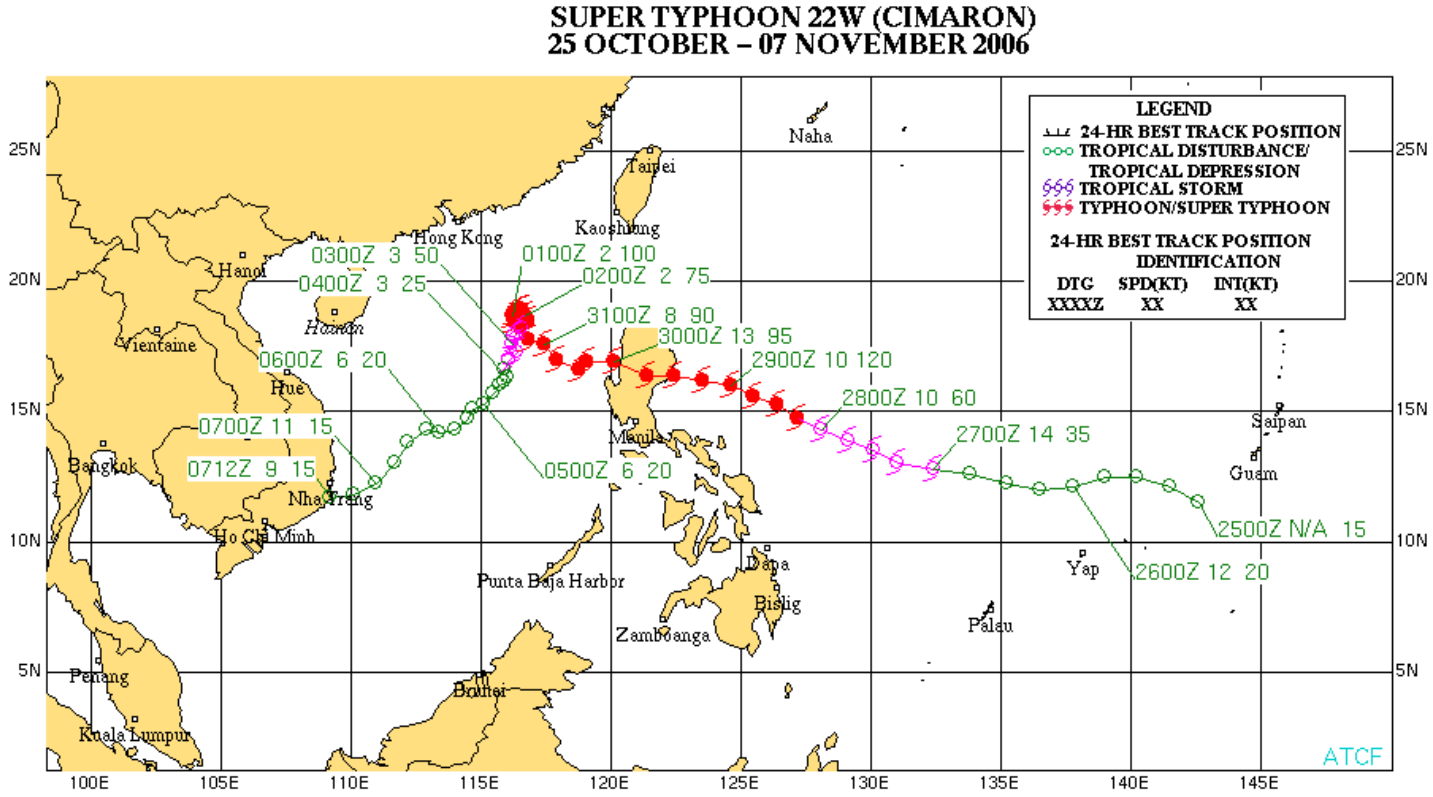
First Poor: 060600Z OCT 06
First Fair: 070600Z OCT 06
First TCFA: 081630Z OCT 06
First Warning: 090000Z OCT 06
Last Warning: 151800Z OCT 06
Max Intensity: 90 kts, gusts to 110 kts
Total Warnings: 28

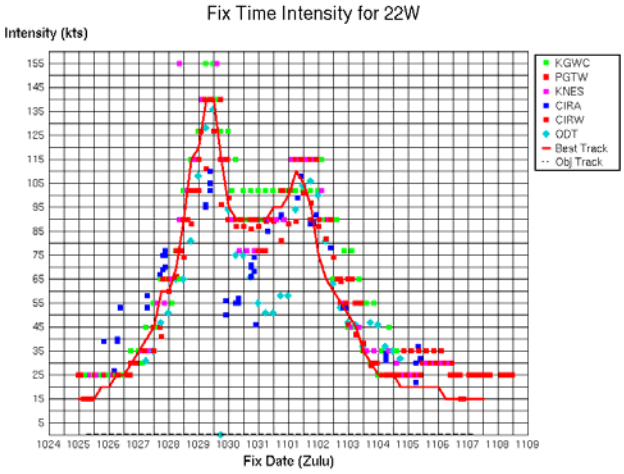




SUPER TYPHOON (STY) 22W (CIMARON)

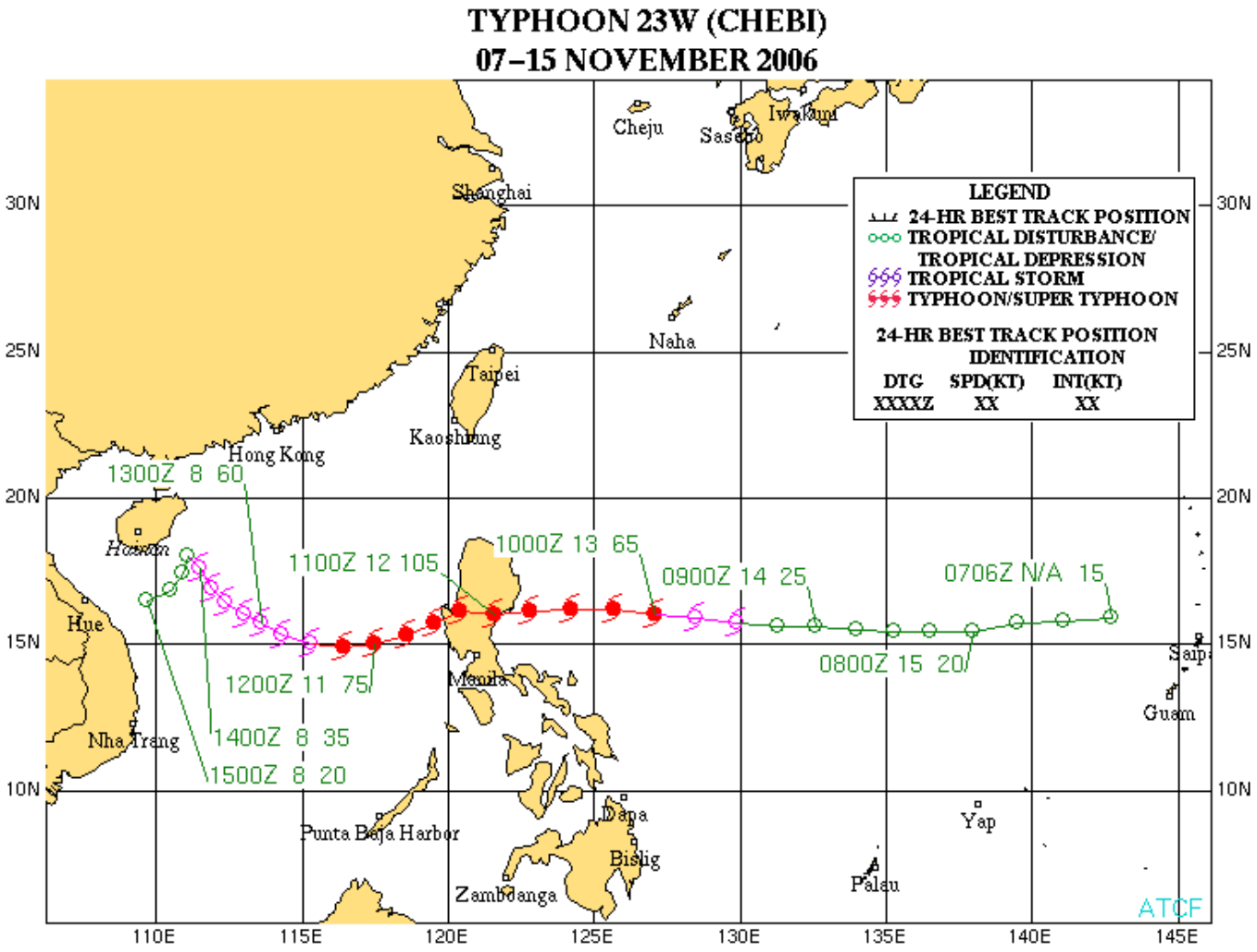
First Poor: 232200Z OCT 06
First Fair: 260230Z OCT 06
First TCFA: 261200Z OCT 06
First Warning: 261800Z 06
Last Warning: 041200Z NOV 06
Max Intensity: 140 kts, gusts to 170 kts
Total Warnings: 36
*Named by WMO Designated RSMC

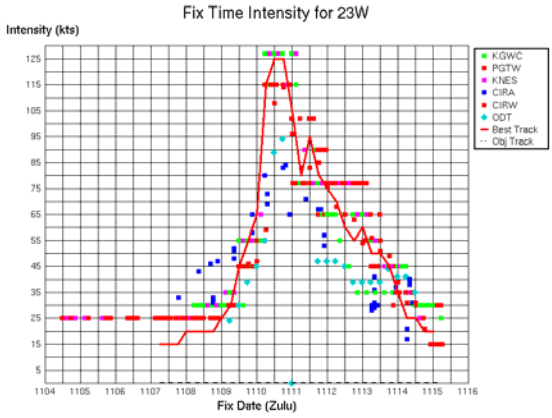




TYPHOON (TY) 23W (CHEBI)

First Poor: 030130Z NOV 06
First Fair: 080130Z NOV 06
First TCFA: 081100Z NOV 06
First Warning: 090000Z NOV 06
Last Warning: 141200Z NOV 06
Max Intensity: 125 kts, gusts to 150 kts
Total Warnings: 23

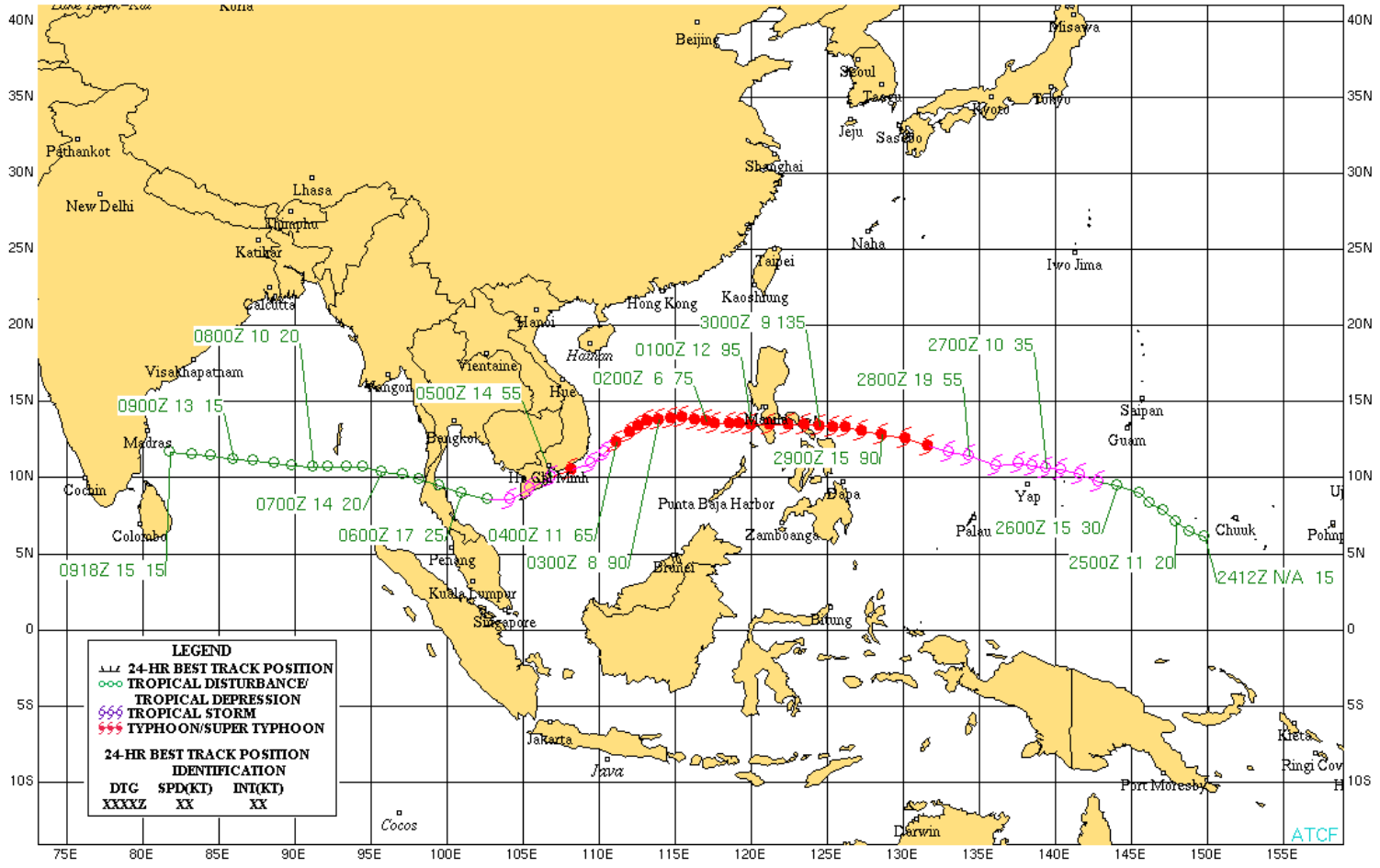


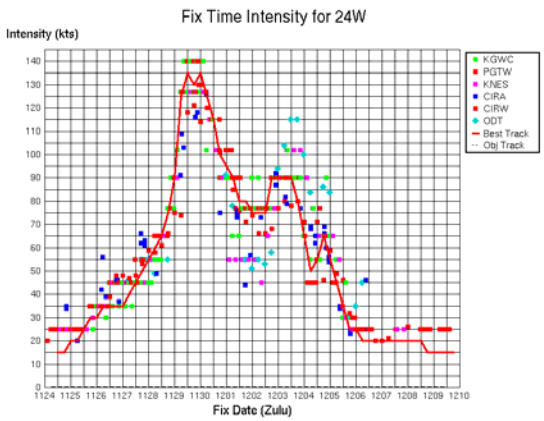


SUPER TYPHOON (STY) 24W (DURIAN)

First Poor: 240600Z NOV 06
First Fair: 250000Z NOV 06
First TCFA: N/A
First Warning: 251800Z NOV 06
Last Warning: 051800Z DEC 06
Max Intensity: 135 kts, gusts to 165 kts
Total Warnings: 41

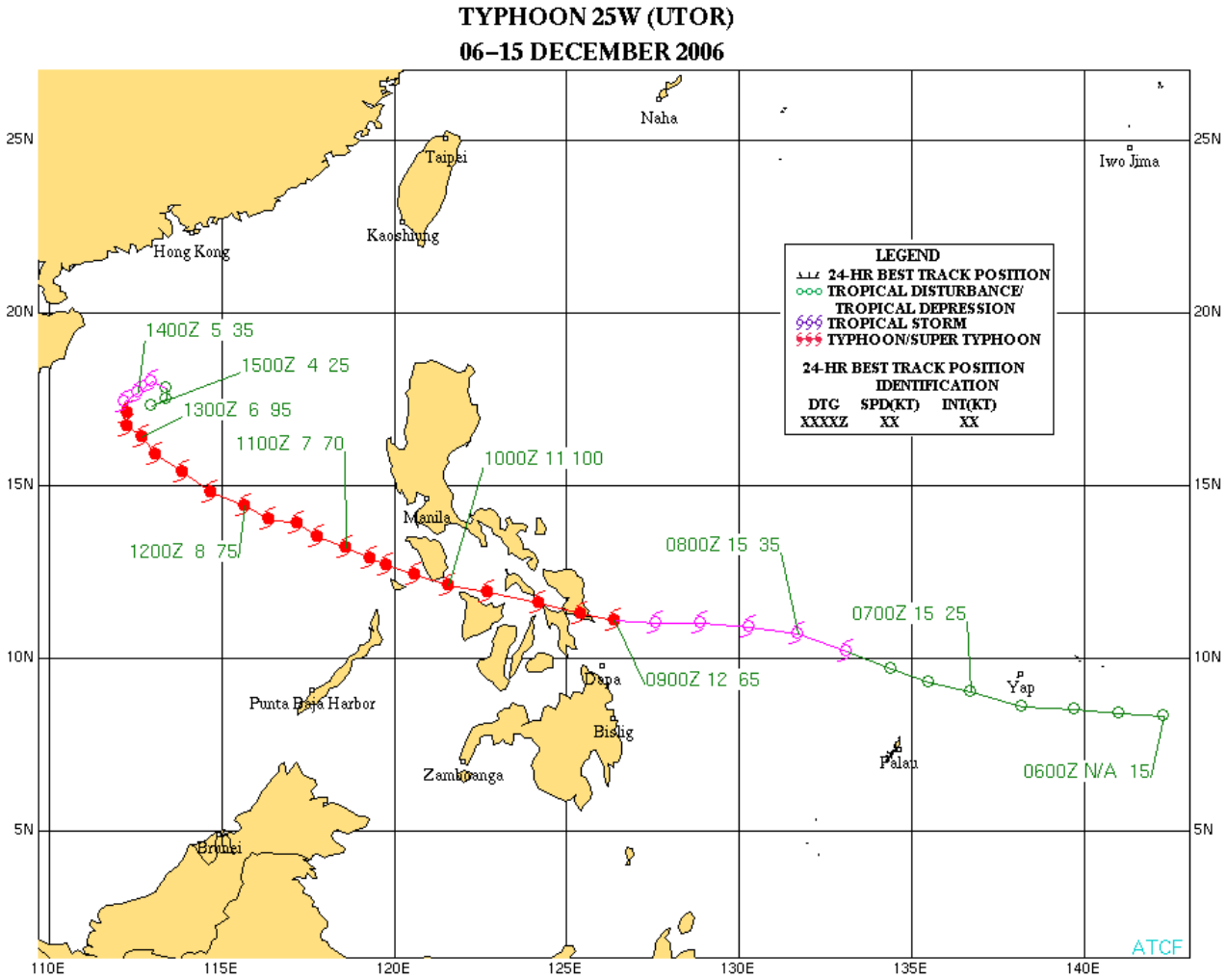
SUPER TYPHOON 24W (DURIAN)
24 NOVEMBER–09 DECEMBER 2006

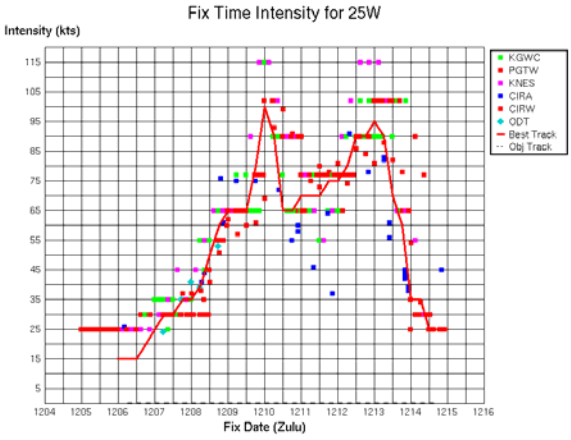




TYPHOON (TY) 25W (UTOR)

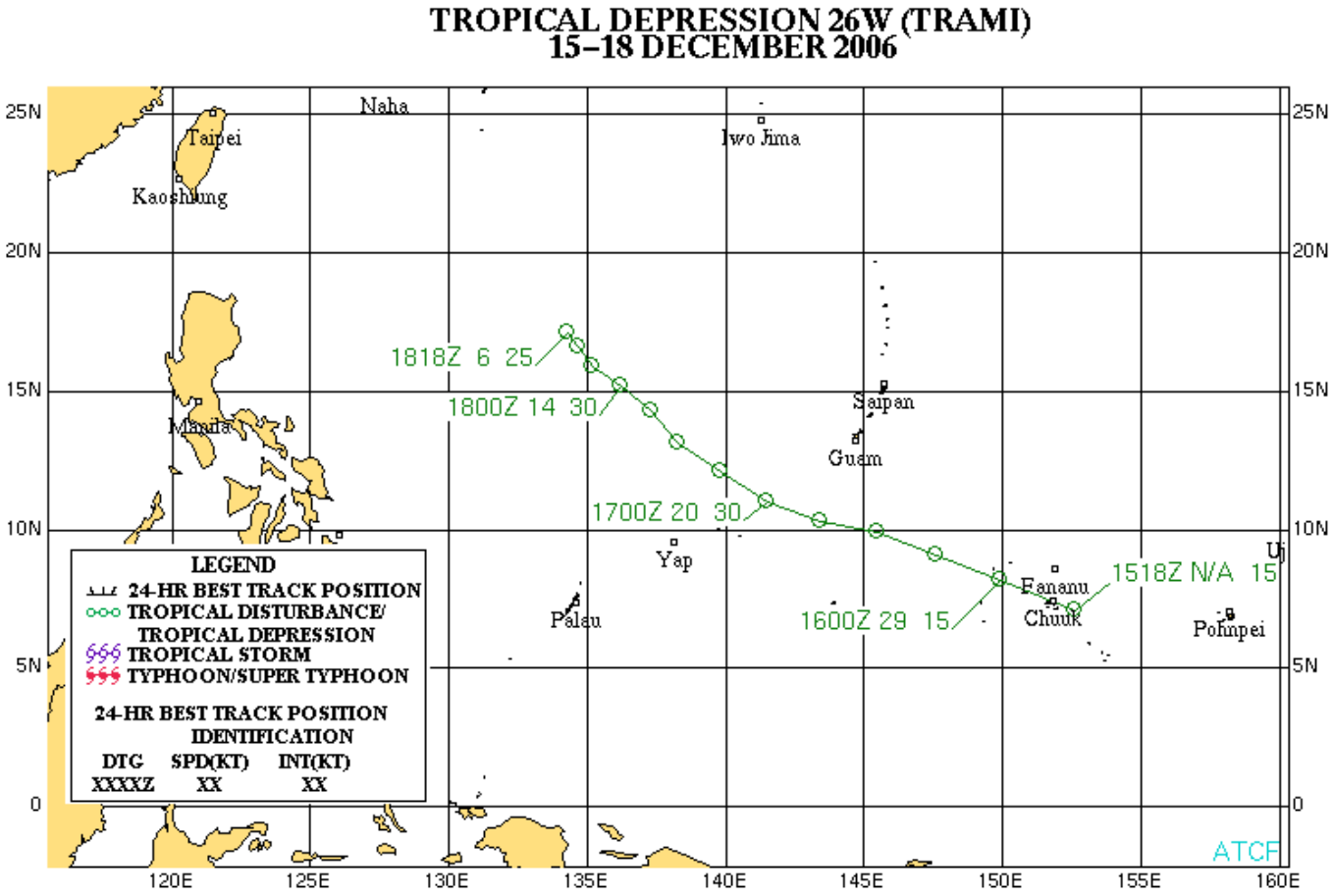
First Poor: 050600Z DEC 06
First Fair: 060600Z DEC 06
First TCFA: 061500Z DEC 06
First Warning: 070000Z DEC 06
Last Warning: 140000Z 06
Max Intensity: 100 kts, gusts to 125 kts
Total Warnings: 29

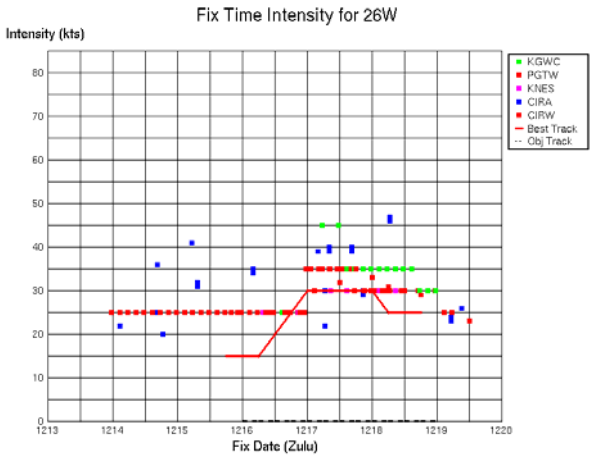




TROPICAL DEPRESSION (TD) 26W (TRAMI)

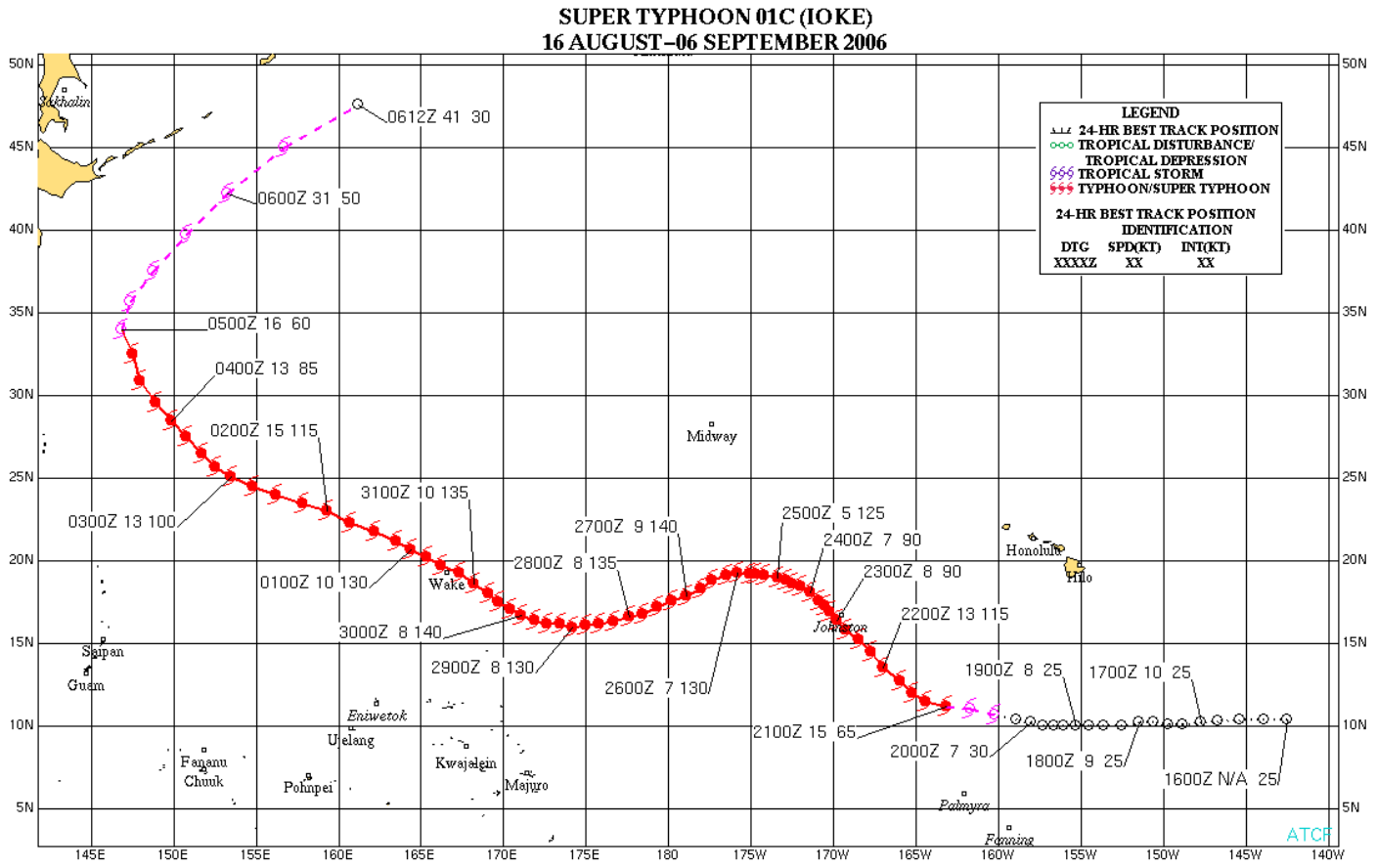
First Poor: 140600Z DEC 06
First Fair: 150130Z DEC 06
First TCFA: N/A
First Warning: 170000Z DEC 06
Last Warning: 181200Z 06
Max Intensity: 30 kts, gusts to 40 kts

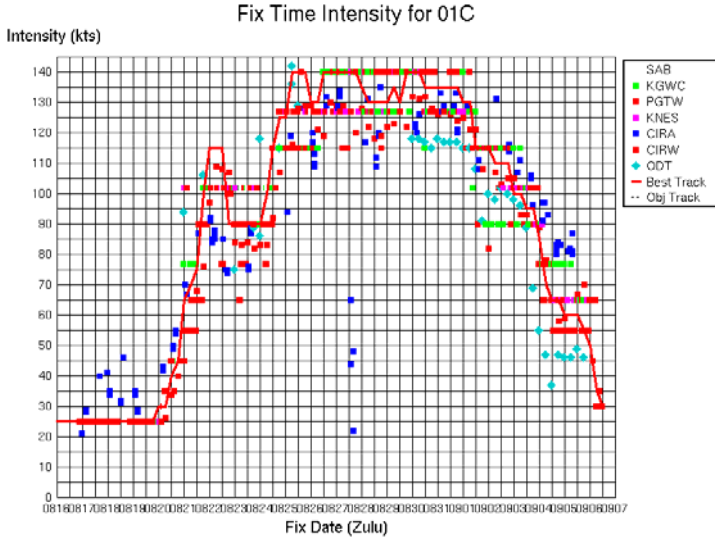




SUPER TYPHOON (STY) 01C (IOKE)

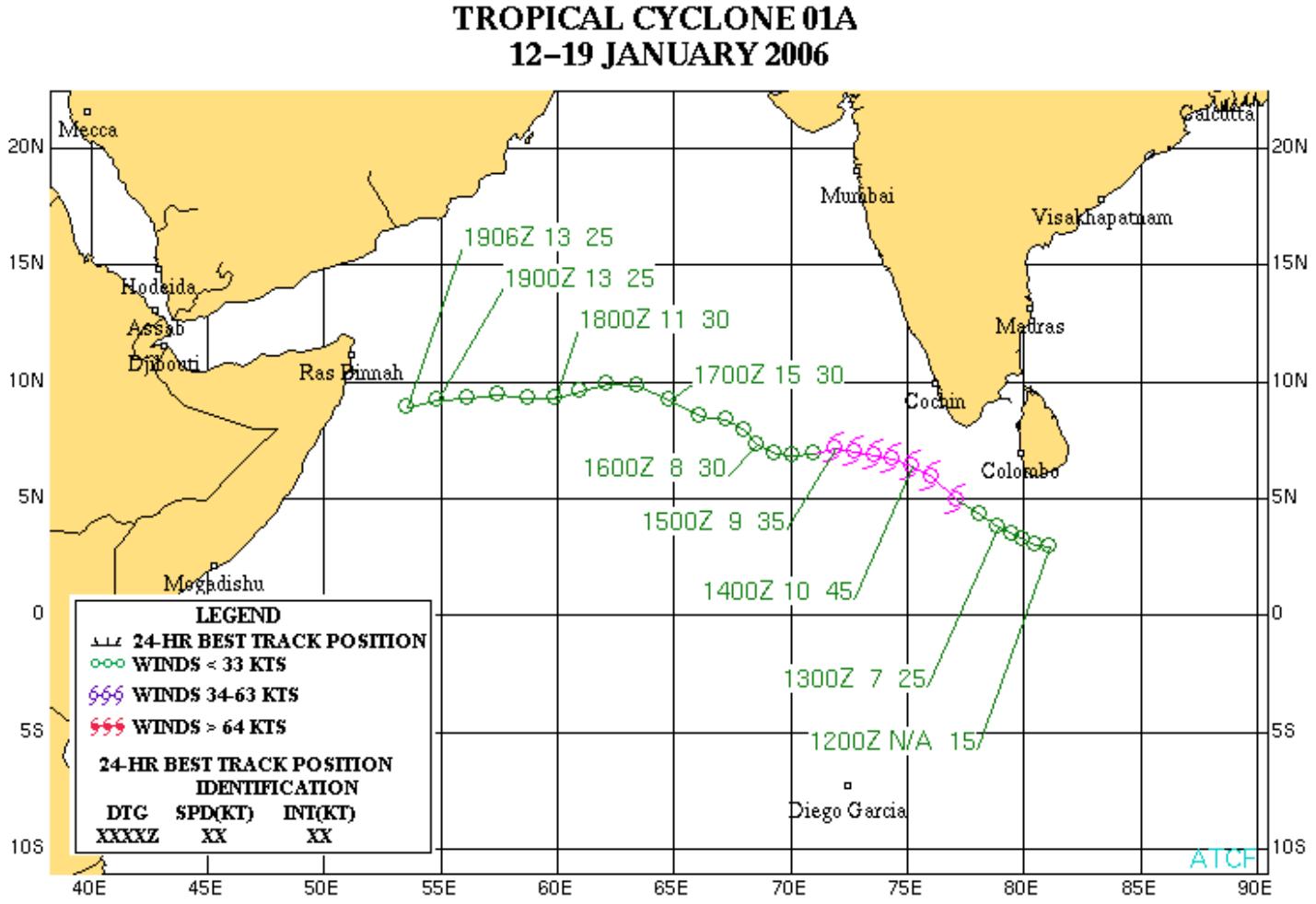
First Poor: CPHC
First Fair: CPHC
First TCFA: 191530Z AUG 06
First Warning: 200335 AUG 06
Last Warning: 050000Z SEP 06
Max Intensity: 140 kts, gusts to 170 kts
Total Warnings: 67

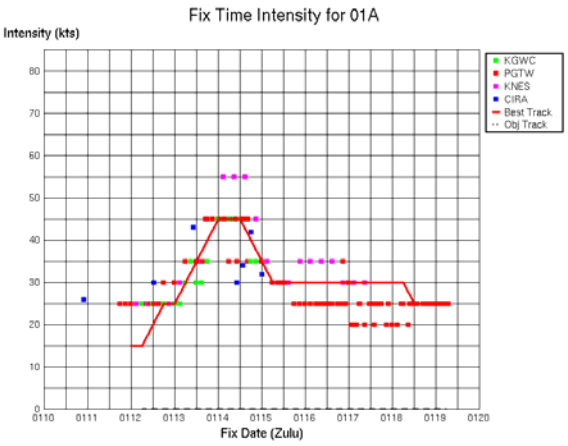




TROPICAL CYCLONE (TC) 01A

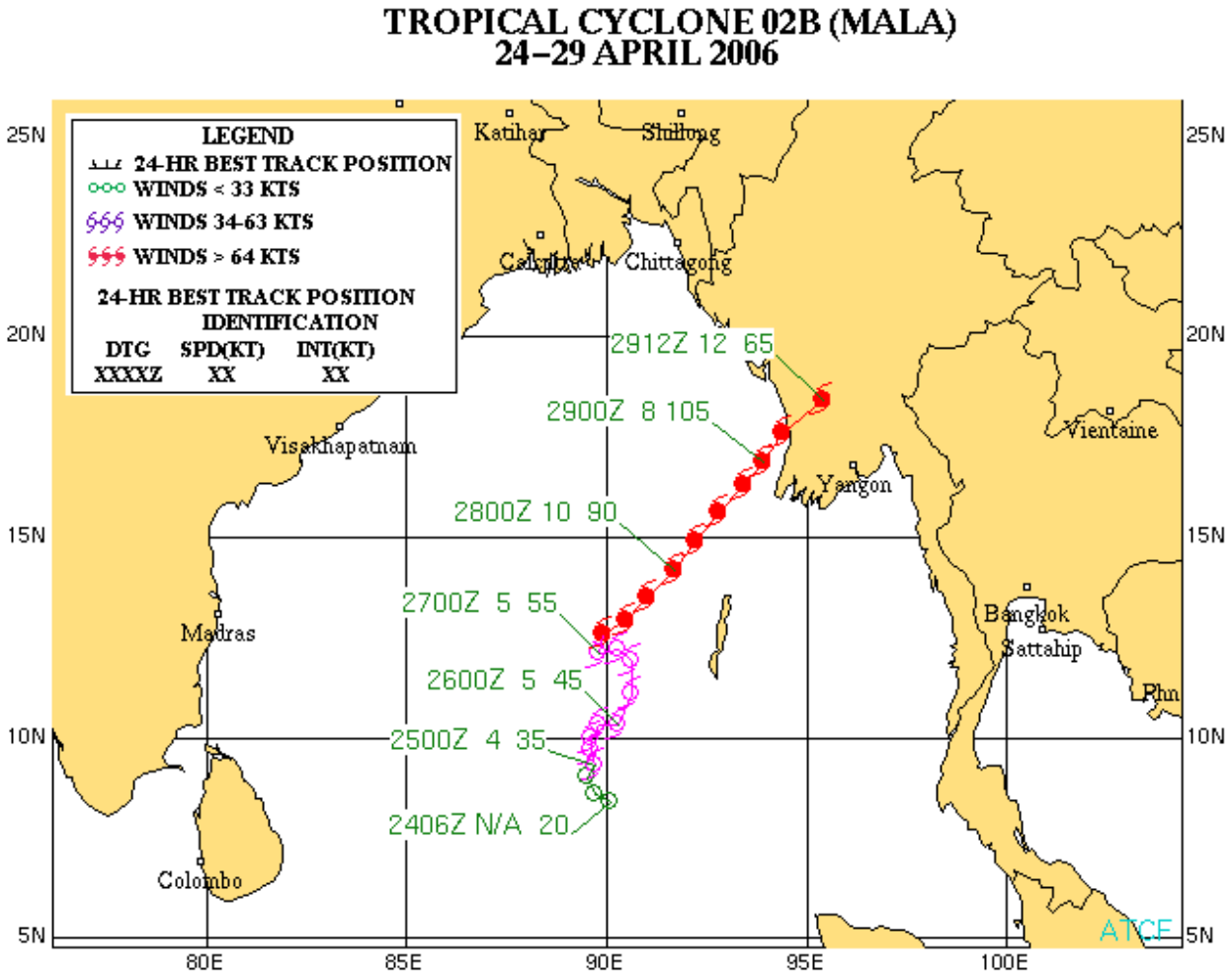
First Poor: 120230Z JAN 06
First Fair: 121800Z JAN 06
First TCFA: 130900Z JAN 06
First Warning: 131800Z JAN 06
Last Warning: 141800Z JAN 06
Max Intensity: 45 kts, gusts to 55 kts
Total Warnings: 3

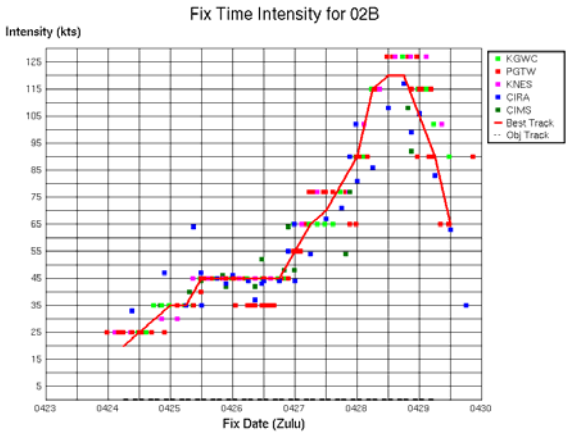




TROPICAL CYCLONE (TC) 02B (MALA)

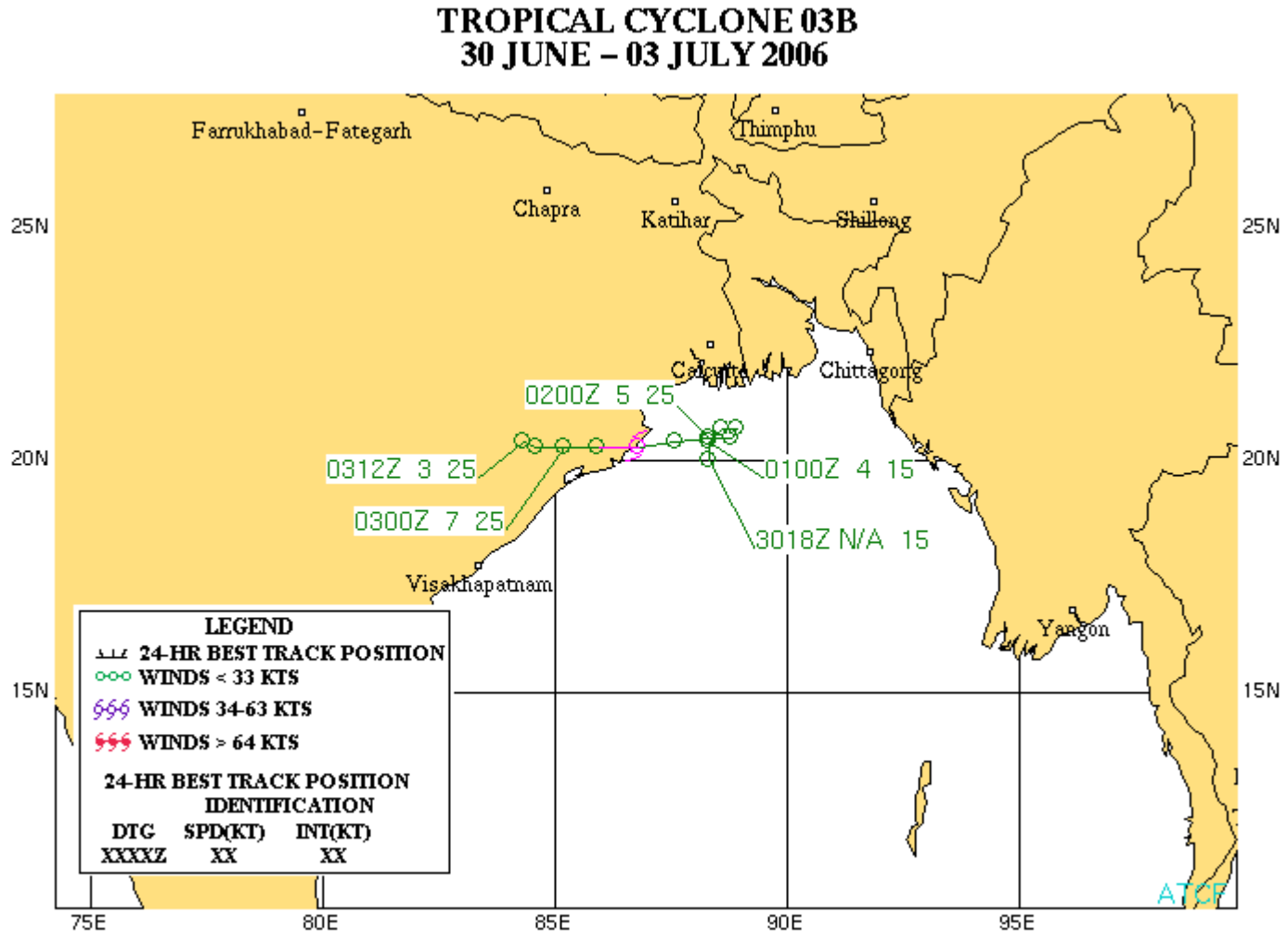
First Poor: 231800Z APR 06
First Fair: 241000Z APR 06
First TCFA: N/A
First Warning: 241800Z APR 06
Last Warning: 291200Z APR 06
Max Intensity: 120 kts, gusts to 145 kts
Total Warnings: 12

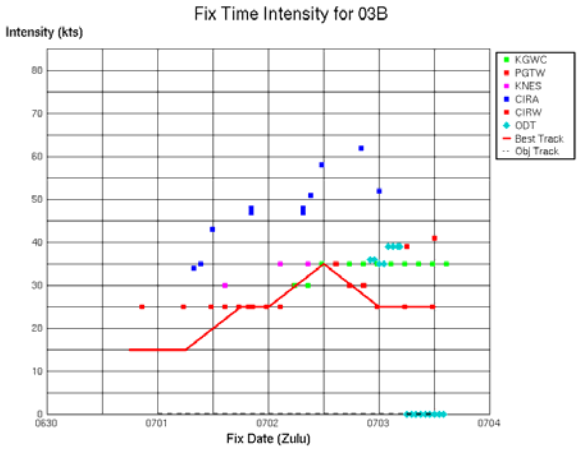




TROPICAL CYCLONE (TC) 03B

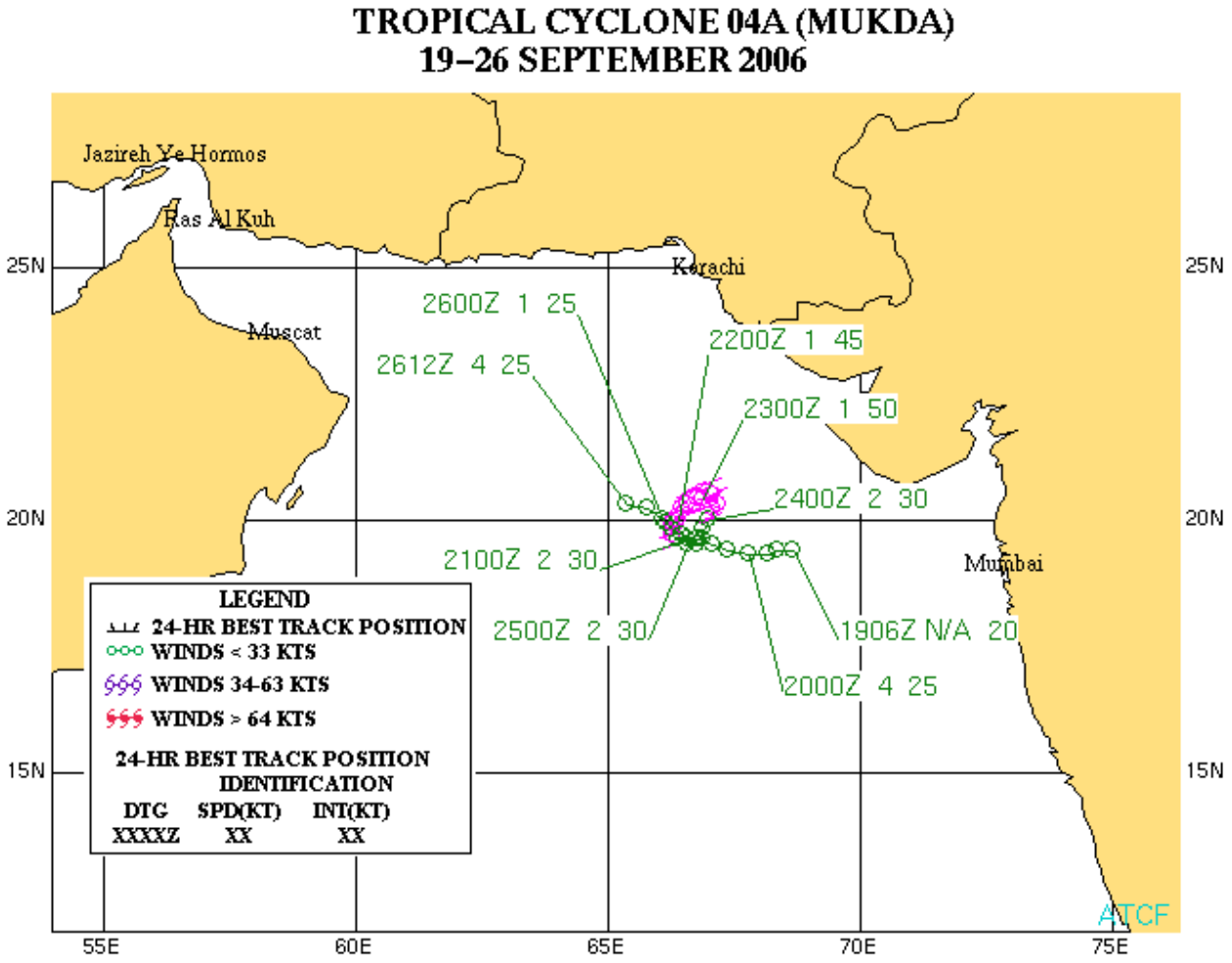
First Poor: 301800Z JUN 06
First Fair: 011800Z JUL 06
First TCFA: N/A
First Warning: 021800Z JUL 06
Last Warning: 030600Z JUL 06
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 2

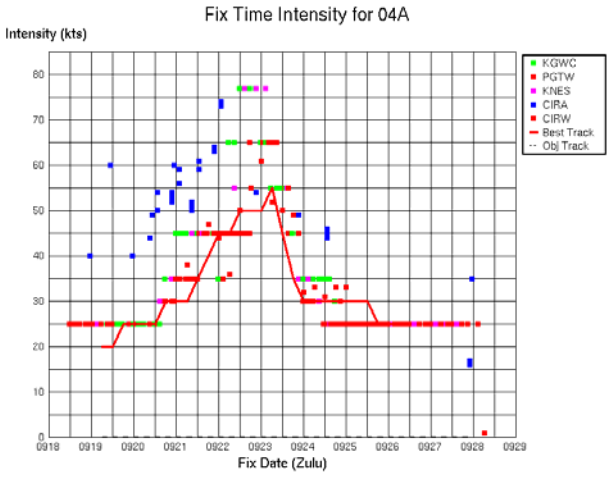




TROPICAL CYCLONE (TC) 04A (MUKDA)

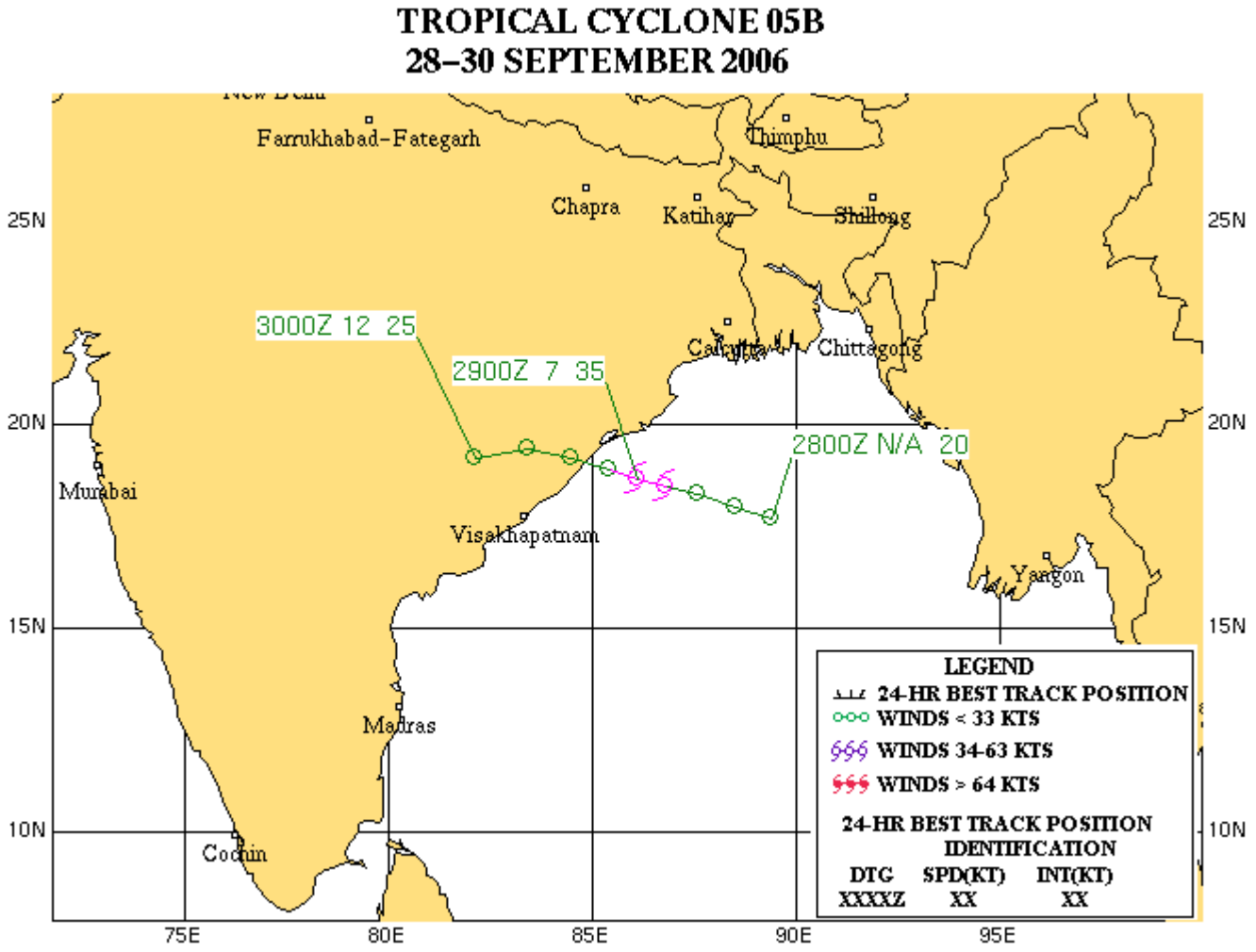
First Poor: 181800Z SEP 06
First Fair: 191000Z SEP 06
First TCFA: 202230Z SEP 06
First Warning: 210000Z SEP 06
Last Warning: 241800Z SEP 06
Max Intensity: 50 kts, gusts to 65 kts

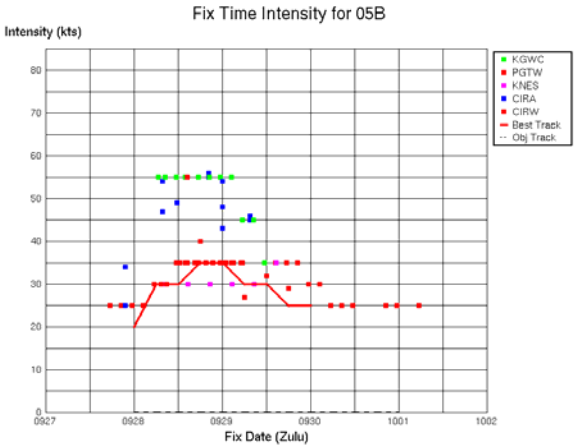




TROPICAL CYCLONE (TC) 05B

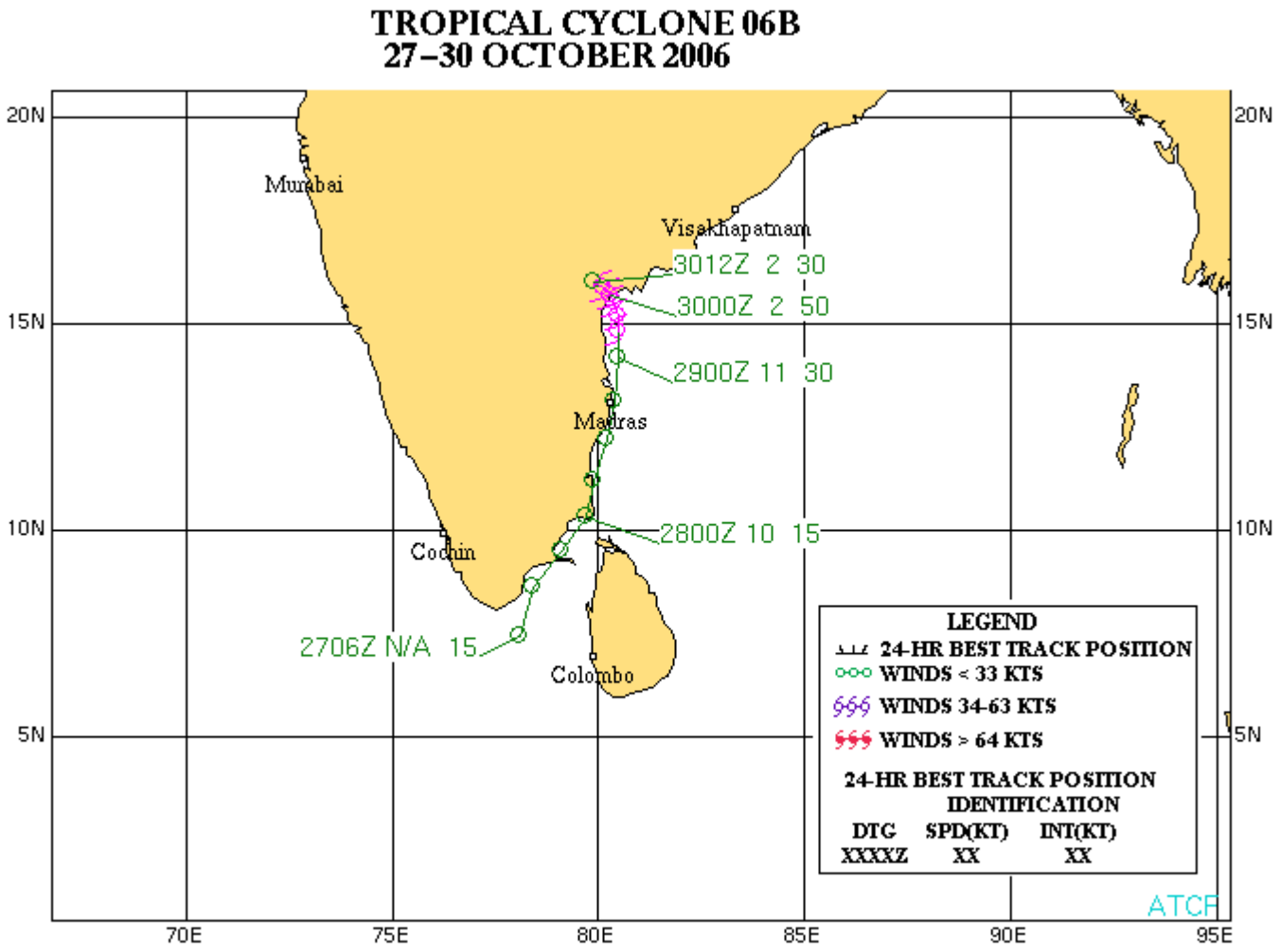
First Poor: 271800Z SEP 06
First Fair: N/A
First TCFA: N/A
First Warning: 281200Z SEP 06
Last Warning: 291200Z SEP 06
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 3

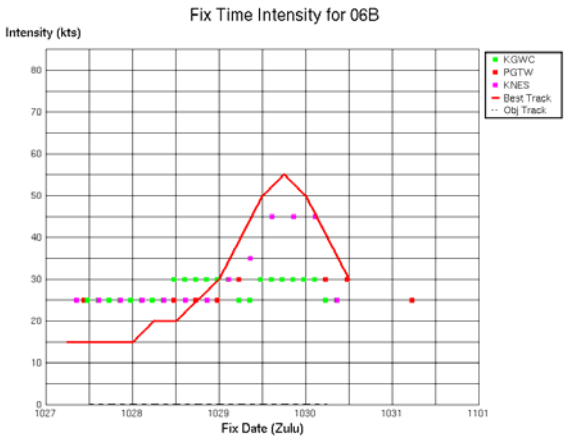




TROPICAL CYCLONE (TC) 06B

First Poor: 271100Z OCT 06
First Fair: 282330Z OCT 06
First TCFA: 291130Z OCT 06
First Warning: N/A
Last Warning: N/A
Max Intensity: 55 kts, gusts to 70 kts
Total Warnings: N/A





2. SOUTH PACIFIC AND SOUTH INDIAN OCEAN TROPICAL CYCLONES

2.1 GENERAL

In accordance with CINCPACINST 3140.1 (series), Southern Hemisphere tropical cyclones are numbered sequentially from 01 July through 30 June to reflect the Southern Hemisphere tropical season.

For warning message delineation, the Southern Hemisphere Area of Responsibility (AOR) is divided into two basins: the South Indian (west of 135° East longitude) and the South Pacific Ocean (east of 135° East longitude). The suffixes "S" (South Indian Ocean) and "P" (South Pacific Ocean) are appended to the tropical cyclone number to differentiate warnings for these basins. For this report, the Southern Hemisphere AOR is broken down into three sub-basins, reflecting primary cyclogenesis areas: South Indian (west of 105° East longitude), Australia (105° East longitude to 165° East longitude), and South Pacific (east of 165° East longitude).

2.2 SUMMARY

Table 2-1 lists the significant tropical cyclones during the 2006 season and can be compared to the climatological mean presented in Table 2-2. Table 2-3 compares this year's tropical cyclone activity in the Southern Hemisphere sub-basins to previous years and climatology. Composites of the tropical cyclone best tracks for the Southern Hemisphere appear following Table 2-3.

Table 2-1 SOUTHERN HEMISPHERE TROPICAL CYCLONES FOR 2006 (01 JULY 2005 - 30 JUNE 2006)

TC	NAME	PERIOD	WARNINGS ISSUED	EST MAX SFC WINDS KTS	MSLP (MB)**
01S	-	14 OCT - 15 OCT	4	40	994
02S	-	05 NOV - 08 NOV	6	35	997
03S	BERTIE-ALVIN	19 NOV - 26 NOV	14	115	927

04S	-	24 DEC - 25 DEC	4	35	997
05S	CLARE	08 JAN - 10 JAN	11	60	980
06P	TAM	14 JAN - 15 JAN	3	40	994
07P	URMIL	14 JAN - 15 JAN	3	60	980
08S	DARYL	19 JAN - 22 JAN	14	50	987
09S	BOLOETSE	25 JAN - 29 JAN	29	100	944
10P	JIM	28 JAN - 01 FEB	14	80	957
11P	VAIANU	11 FEB - 16 FEB	11	75	967
12S	-	19 FEB - 20 FEB	3	45	991
13P	KATE	22 FEB - 24 FEB	4	55	984
14S	CARINA	23 FEB - 02 MAR	16	130	910
15S	EMMA	27 FEB - 28 FEB	2	35	997
16S	DIWA	04 MAR - 08 MAR	11	55	984
17P	LARRY	18 MAR - 20 MAR	10	110	933
18P	WATI	19 MAR - 24 MAR	21	80	963
19S	FLOYD	21 MAR - 26 MAR	21	115	927
20S	GLENDA	27 MAR - 30 MAR	14	140	898
21S	HUBERT	05 APR - 07 APR	11	55	984
22S	ELIA	12 APR - 15 APR	7	55	984
23P	MONICA	17 APR - 24 APR	17	155	879
		Total#	250		

**MSLP Converted from estimated maximum surface winds using Atkinson/Holliday wind pressure relationship. Number of warnings issued includes Amended warnings.

Table 2-2 DISTRIBUTION OF SOUTH PACIFIC AND SOUTH INDIAN OCEAN TROPICAL CYCLONES FOR 1958 - 2006

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTALS
1958 - 1977 AVERAGE*													
-	-	-	-	0.4	1.5	3.6	6.1	5.8	4.7	2.1	0.5	-	24.7
1981 - 2006													
1981	0	0	0	1	3	2	6	5	3	3	1	0	24
1982	1	0	0	1	1	3	9	4	2	3	1	0	25
1983	1	0	0	1	1	3	5	6	3	5	0	0	25
1984	1	0	0	1	2	5	5	10	4	2	0	0	30
1985	0	0	0	0	1	7	9	9	6	3	0	0	35
1986	0	0	1	0	1	1	9	9	6	4	2	0	33
1987	0	1	0	0	1	3	6	8	3	4	1	1	28
1988	0	0	0	0	2	3	5	5	3	1	2	0	21
1989	0	0	0	0	2	1	5	8	6	4	2	0	28
1990	2	0	1	1	2	2	4	4	10	2	1	0	29
1991	0	0	1	1	1	3	2	5	5	2	1	1	22
1992	0	0	1	1	2	5	4	11	3	2	1	0	30
1993	0	0	1	1	0	5	7	7	2	2	2	0	27
1994	0	0	0	0	2	4	8	4	9	3	0	0	30

1995	0	0	0	0	2	2	5	4	5	4	0	0	22
1996	0	0	0	0	1	3	7	6	6	4	1	0	28
1997	1	1	1	2	2	6	9	8	3	1	3	1	38
1998	1	0	0	3	2	3	7	9	6	6	0	0	37
1999	1	0	1	1	1	6	6	8	7	2	0	0	33
2000	0	0	0	0	0	3	6	5	7	6	0	0	27
2001	0	1	0	0	1	1	4	6	2	5	0	1	21
2002	0	0	0	2	4	1	4	5	4	2	3	0	25
2003	0	0	1	0	2	5	5	7	5	2	1	1	29
2004	0	0	0	1	1	3	6	3	7	1	1	0	23
2005	0	0	1	1	2	2	7	7	4	2	0	0	26
2006	6	5	5	3	0	0	0	0	0	1	2	1	23
(1981-2006)													
MEAN	0.5	0.3	0.5	0.8	1.5	3.2	5.8	6.3	4.7	2.9	1.0	0.2	27.7
CASES	14	8	14	21	39	82	150	163	121	76	25	6	719

* (GRAY, 1978)

The criteria used in TABLE 2-2 are as follows:

1) If a tropical cyclone was first warned on during the last two days of a particular month and continued into the next month for longer than two days, then that system was attributed to the second month.

2) If a tropical cyclone was warned on prior to the last two days of a month, it was attributed to the first month, regardless of how long the system lasted.

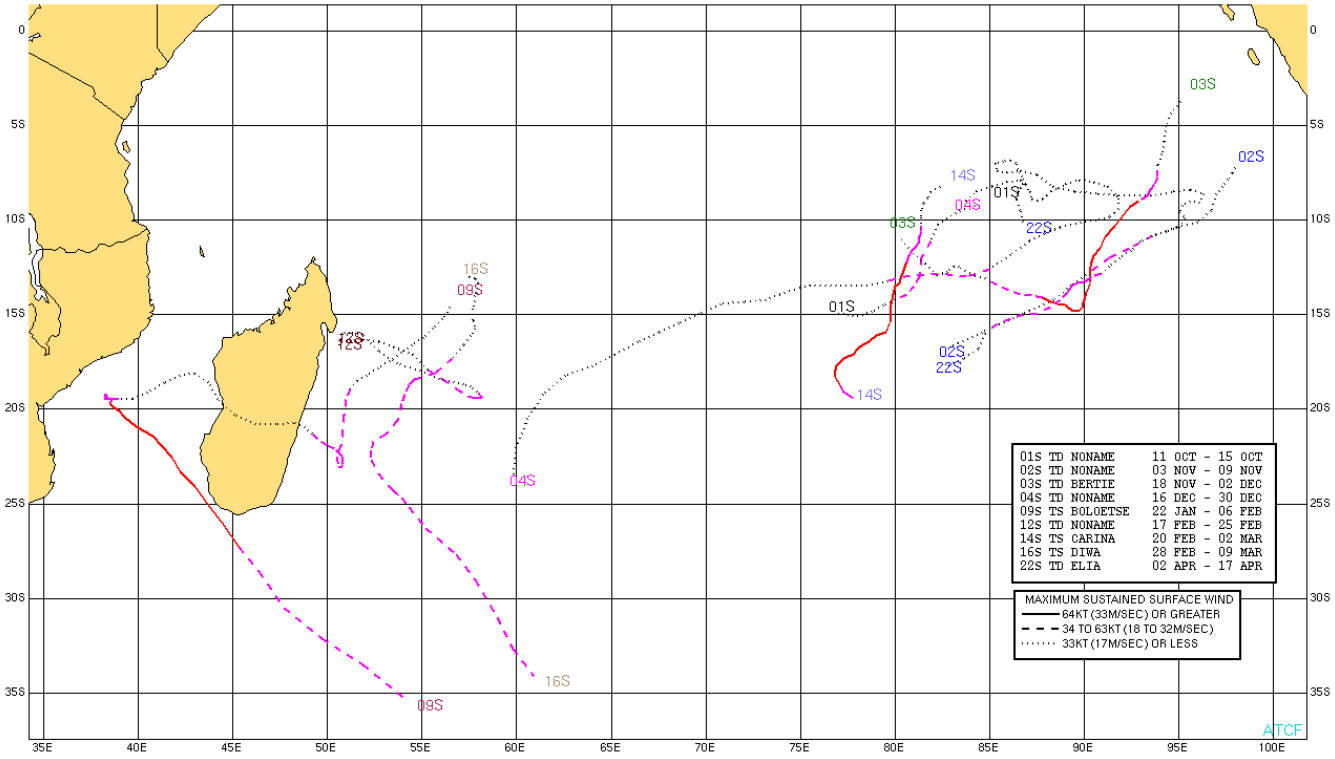
3) If a tropical cyclone began on the last day of the month and ended on the first day of the next month, that system was attributed to the first month. However, if a tropical cyclone began on the last day of the month and continued into the next month for only two days, then it was attributed to the second month.

Table 2-3 ANNUAL VARIATION OF SOUTHERN HEMISPHERE TROPICAL CYCLONES BY OCEAN BASIN 1958 - 2006

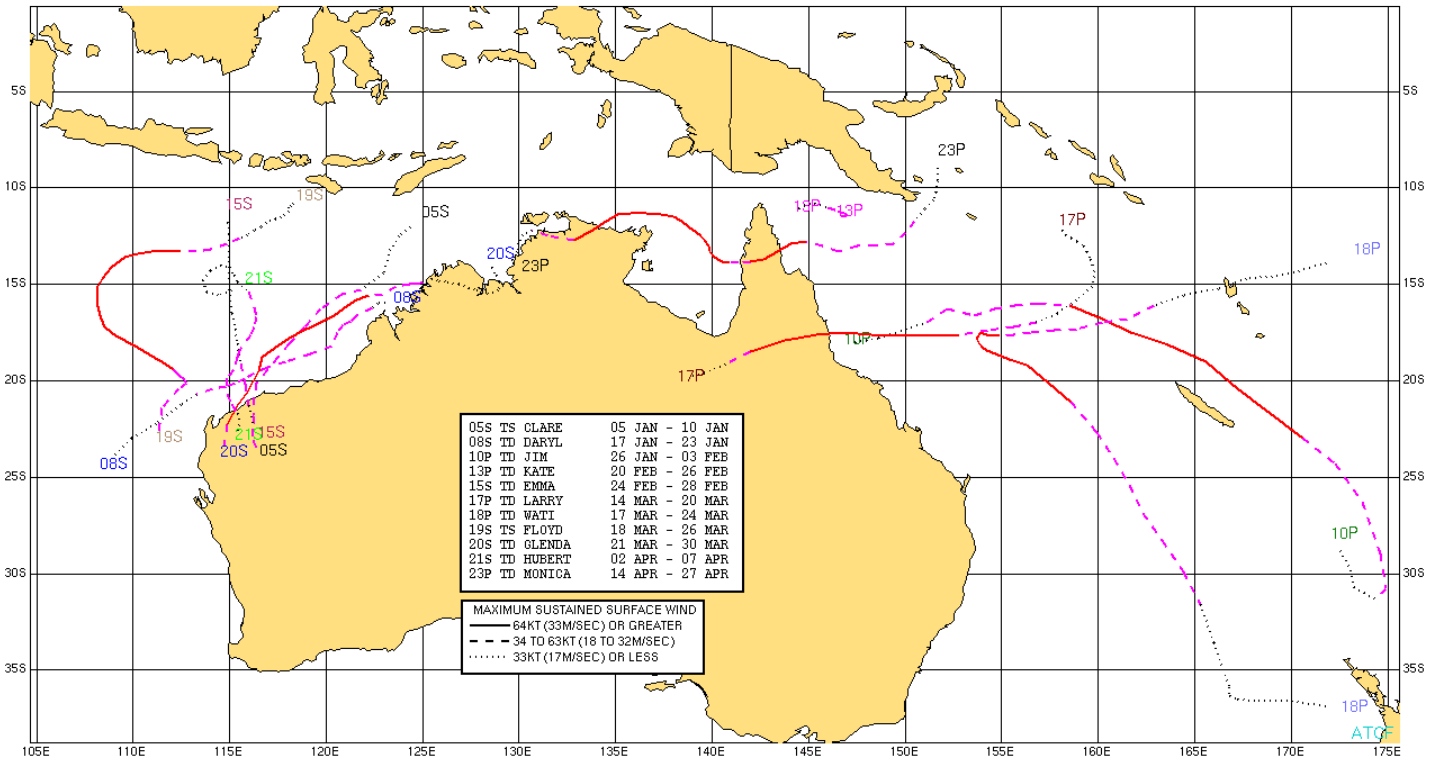
YEAR	SOUTH INDIAN (WEST OF 105°E)	AUSTRALIAN (105°E - 165°E)	SOUTH PACIFIC (EAST OF 165°E)	TOTAL
1958 - 1977 AVERAGE*				
	8.4	10.3	5.9	24.6
1981 - 2006				
1981	13	8	3	24
1982	12	11	2	25
1983	7	6	12	25
1984	14	14	2	30
1985	14	15	6	35
1986	14	16	3	33
1987	9	8	11	28
1988	14	2	5	21
1989	12	9	7	28
1990	18	8	3	29

1991	11	10	1	22
1992	11	6	13	30
1993	10	16	1	27
1994	16	10	4	30
1995	11	7	4	22
1996	13	11	4	28
1997	17	5	16	38
1998	12	10	15	37
1999	13	16	4	33
2000	10	12	5	27
2001	10	8	3	21
2002	14	7	4	25
2003	14	6	9	29
2004	13	7	3	23
2005	12	8	6	26
2006	9	11	3	23
1981 - 2006				
MEAN	12.4	9.5	5.7	27.7
CASES	323	247	149	719
*(Gray, 1978)				

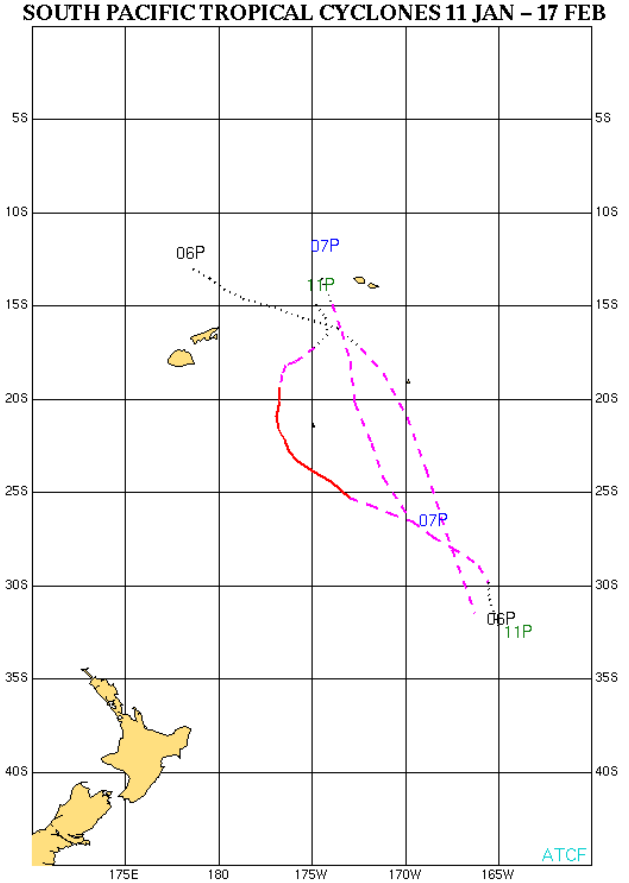
SOUTH INDIAN OCEAN TROPICAL CYCLONES 11 OCT 05 – 17 APR 06



AUSTRALIAN TROPICAL CYCLONES 05 JAN – 27 APR



SOUTH PACIFIC TROPICAL CYCLONES 11 JAN – 17 FEB

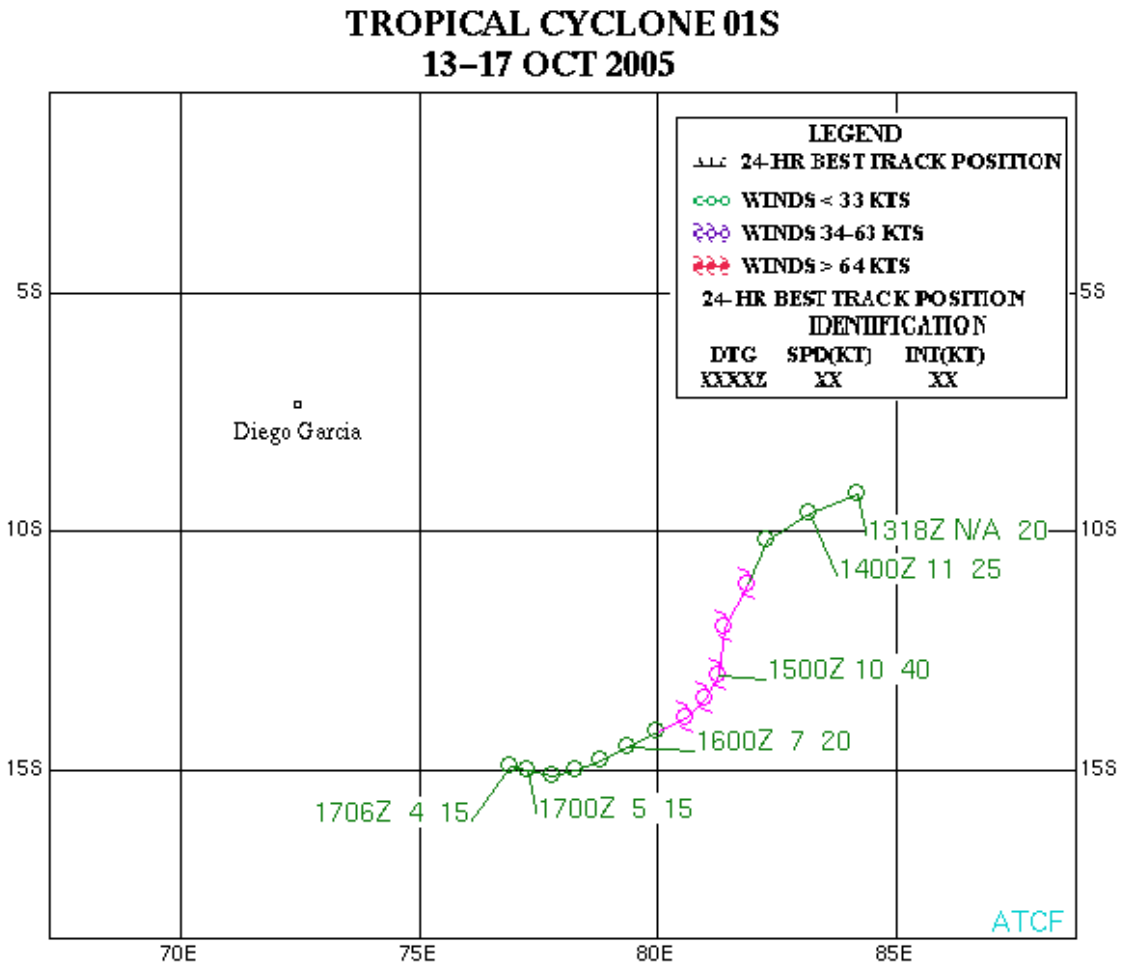


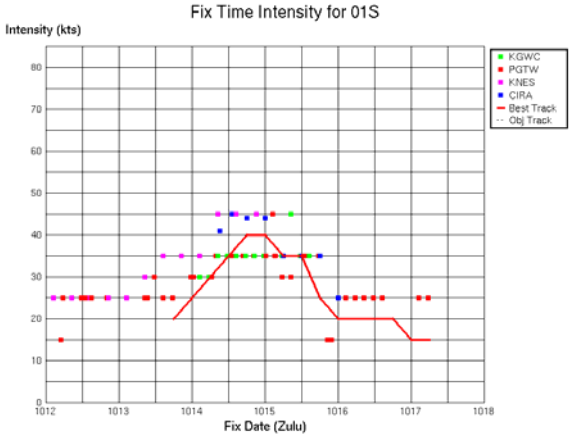
06P TS TAM 11 JAN - 14 JAN
07P TS URMIL 13 JAN - 15 JAN
11P TD VAIANU 10 FEB - 17 FEB

MAXIMUM SUSTAINED SURFACE WIND
64KT (33M/SEC) OR GREATER
34 TO 63KT (18 TO 32M/SEC)
33KT (17M/SEC) OR LESS

TROPICAL CYCLONE (TC) 01S

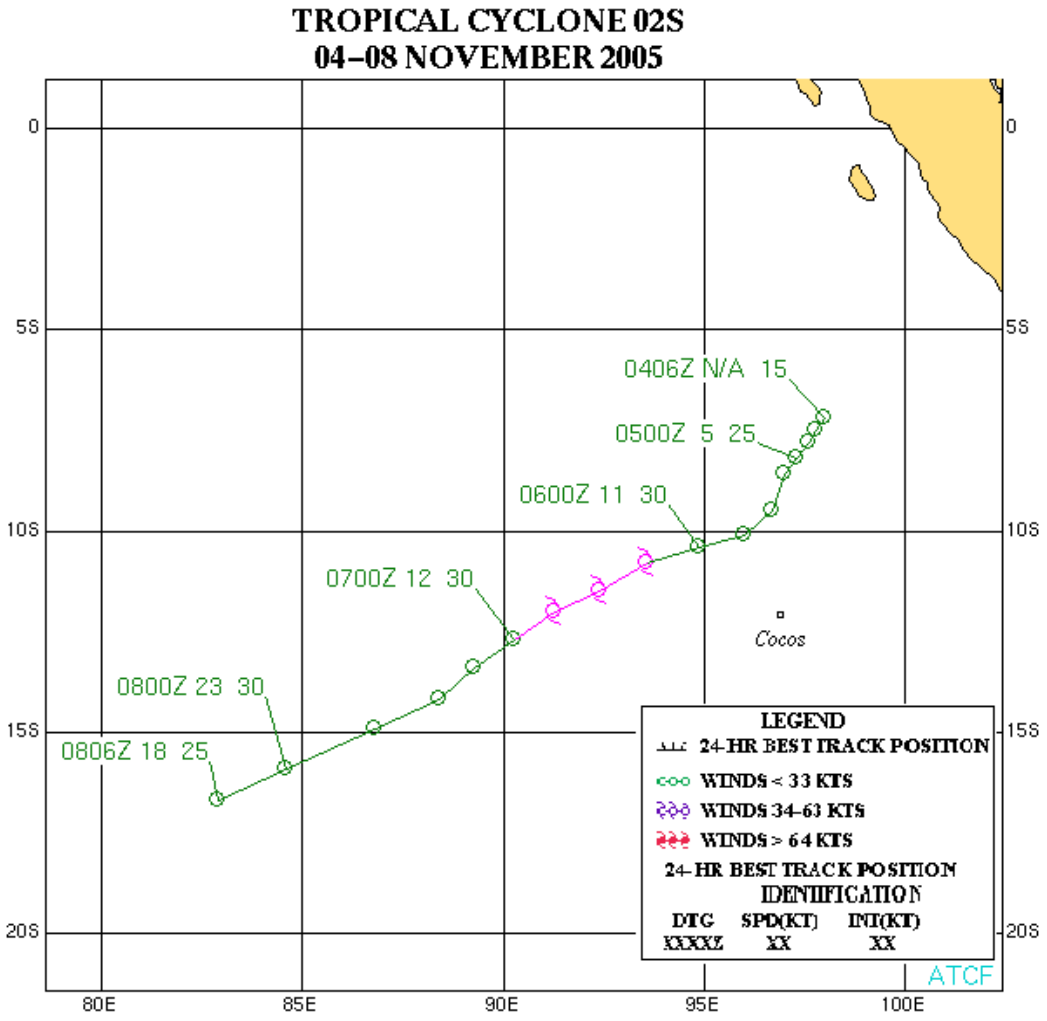
First Poor: 121800Z OCT 05
First Fair: 132200Z OCT 05
First TCFA: 140130Z OCT 05
First Warning: 141200Z OCT 05
Last Warning: 151800Z OCT 05
Max Intensity: 40 kts, gusts to 50 kts
Total Warnings: 4

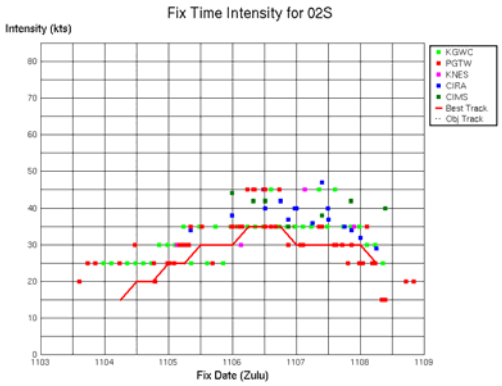




TROPICAL CYCLONE (TC) 02S

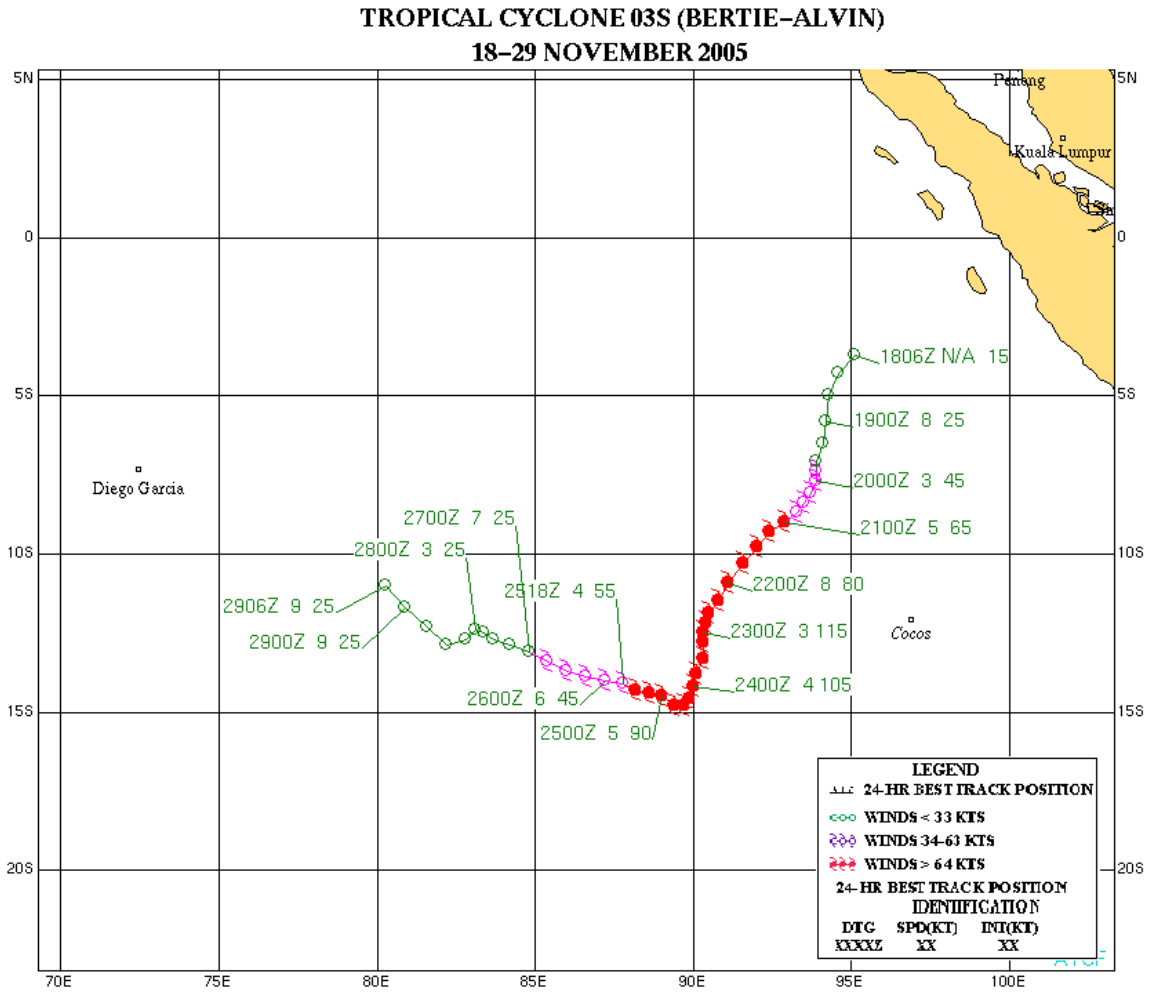
First Poor: 040930Z NOV 05
First Fair: N/A
First TCFA: 050730Z NOV 05
First Warning: 051800Z NOV 05
Last Warning: 080600Z NOV 05
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 6

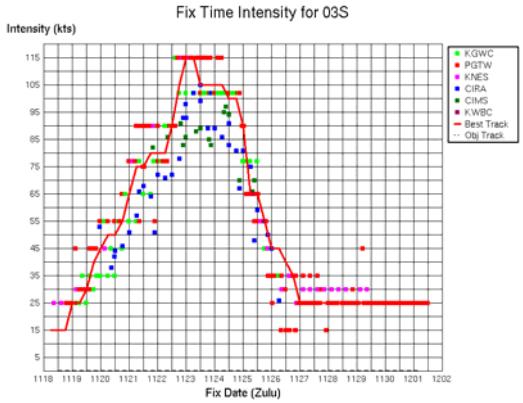




TROPICAL CYCLONE (TC) 03S (BERTIE-ALVIN)

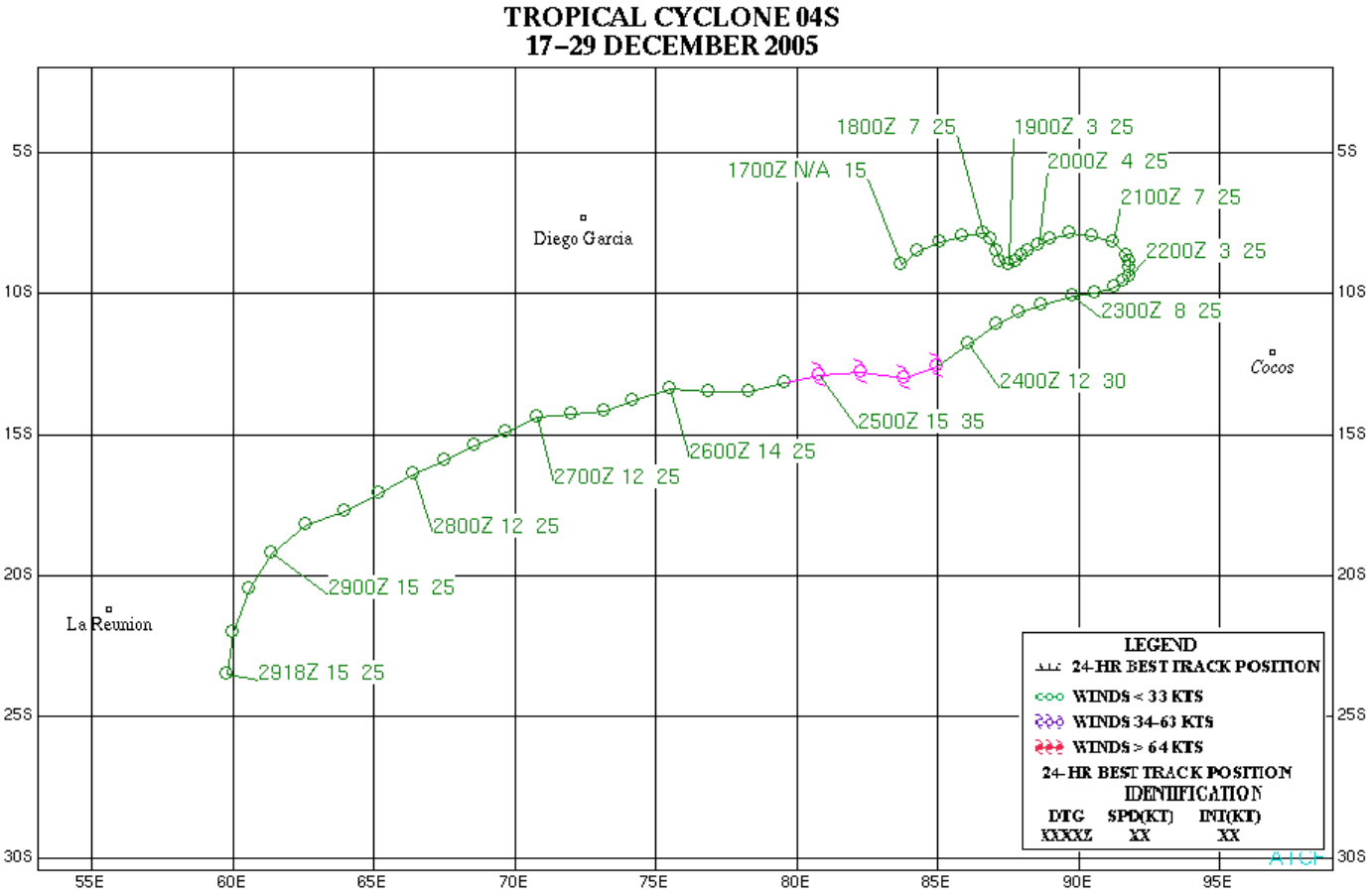
First Poor: 180900Z NOV 05
First Fair: 190030Z NOV 05
First TCFA: 191000Z NOV 05
First Warning: 191800Z NOV 05
Last Warning: 260000Z NOV 05
Max Intensity: 115 kts, gusts to 140 kts
Total Warnings: 14

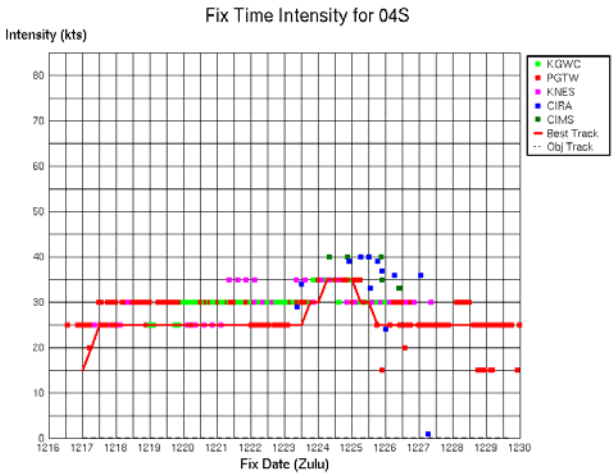




TROPICAL CYCLONE (TC) 04S

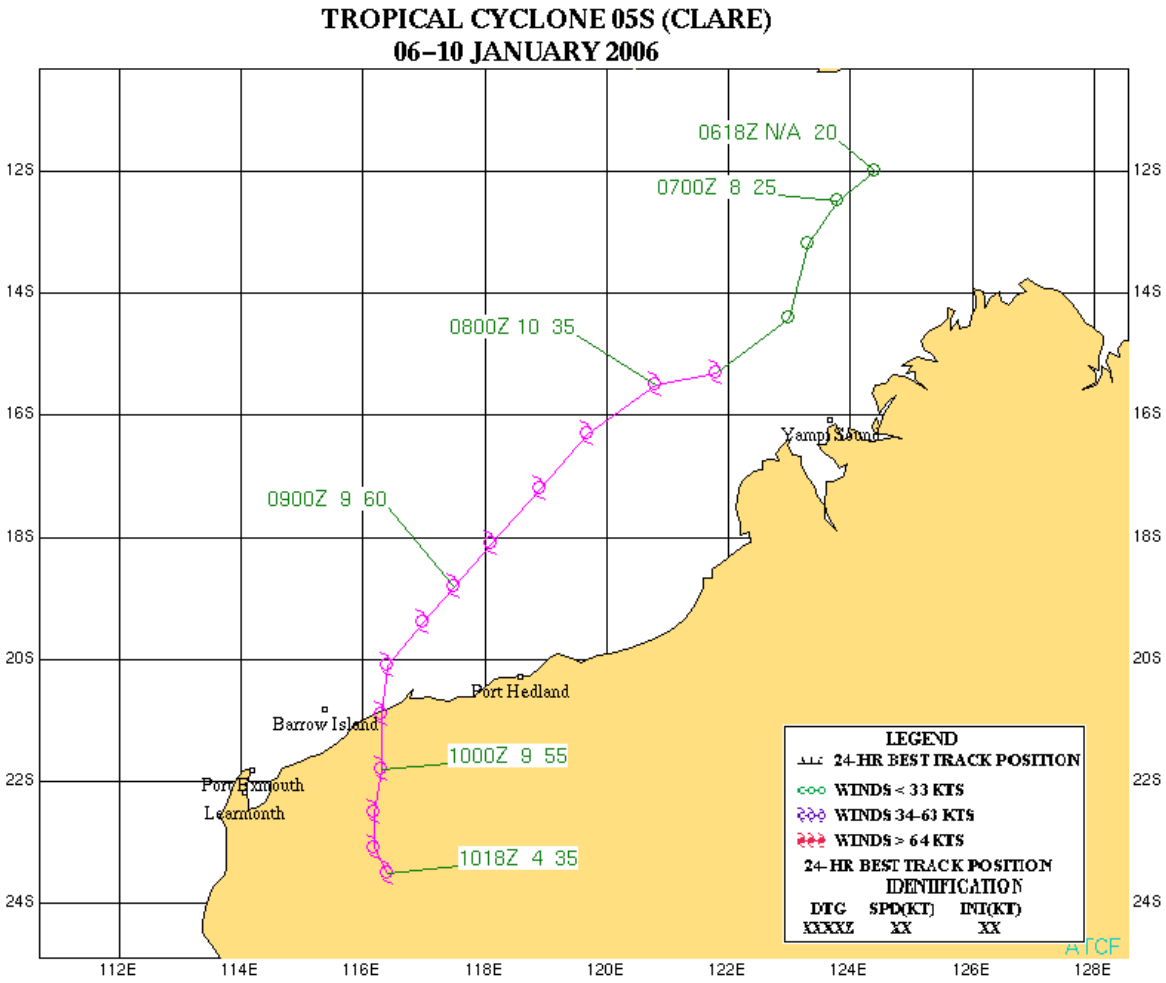
First Poor: 171100Z DEC 05
First Fair: 230700Z DEC 05
First TCFA: N/A
First Warning: 240600Z DEC 05
Last Warning: 251800Z DEC 05
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 4

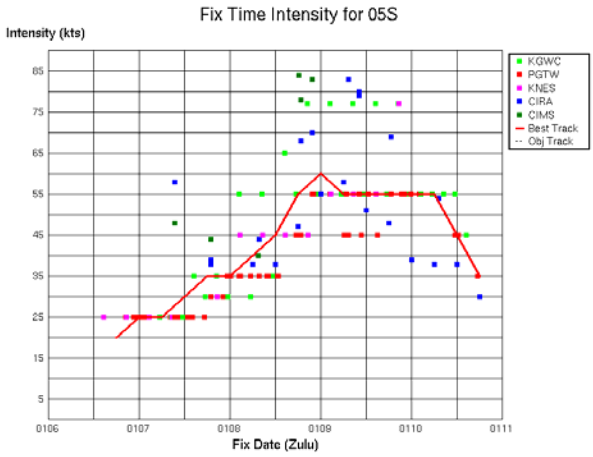




TROPICAL CYCLONE (TC) 05S (CLARE)

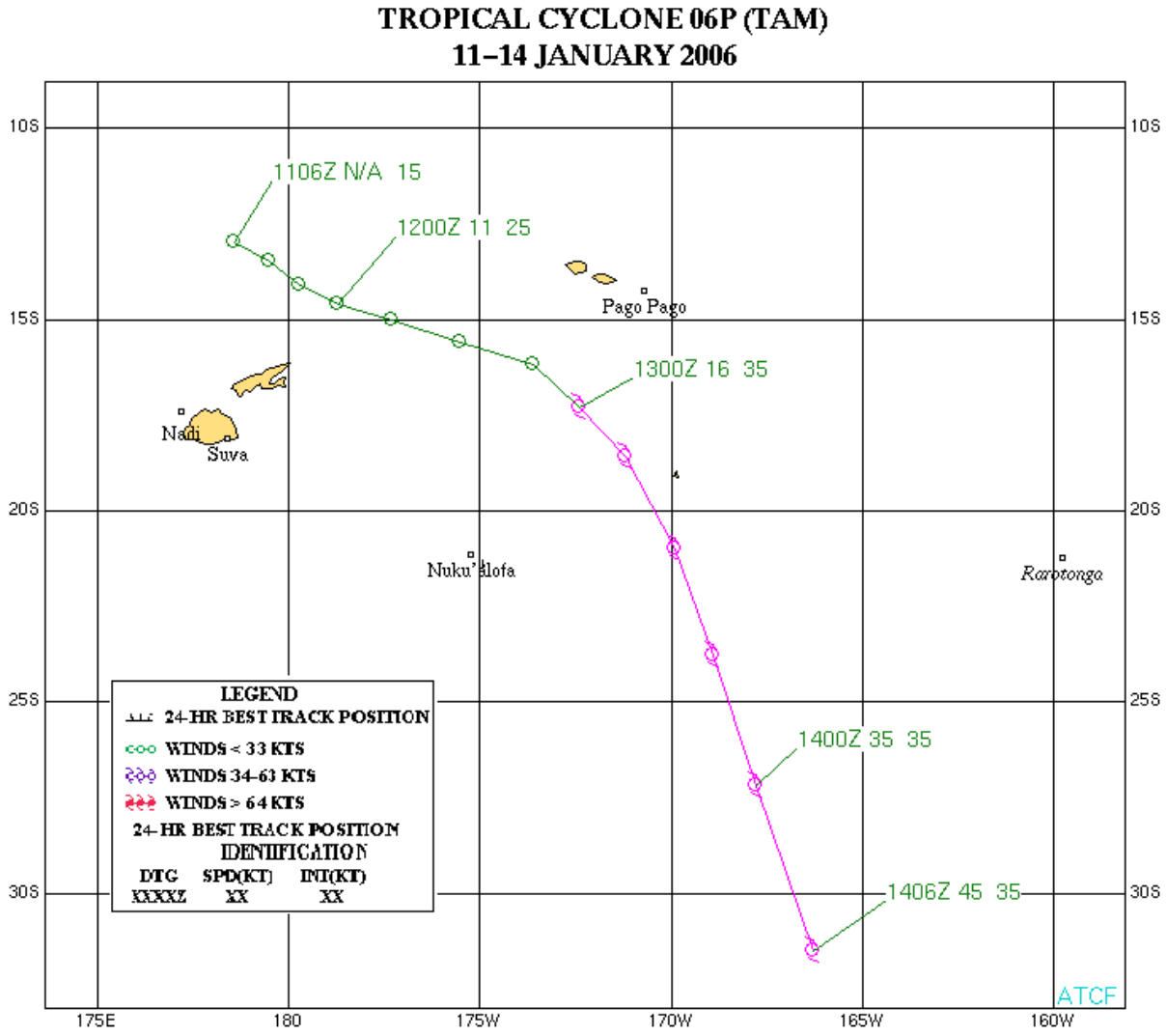
First Poor: N/A
First Fair: 070600Z JAN 06
First TCFA: 072030Z JAN 06
First Warning: 080000Z JAN 06
Last Warning: 101200Z JAN 06
Max Intensity: 60 kts, gusts to 75 kts
Total Warnings: 11

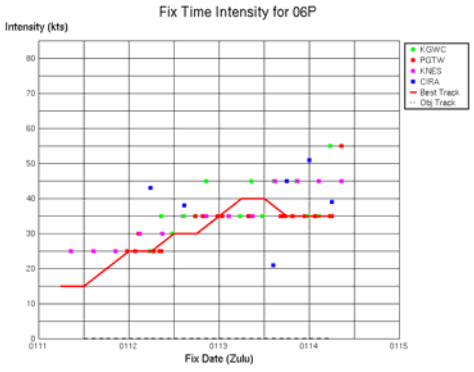




TROPICAL CYCLONE (TC) 06P (TAM)

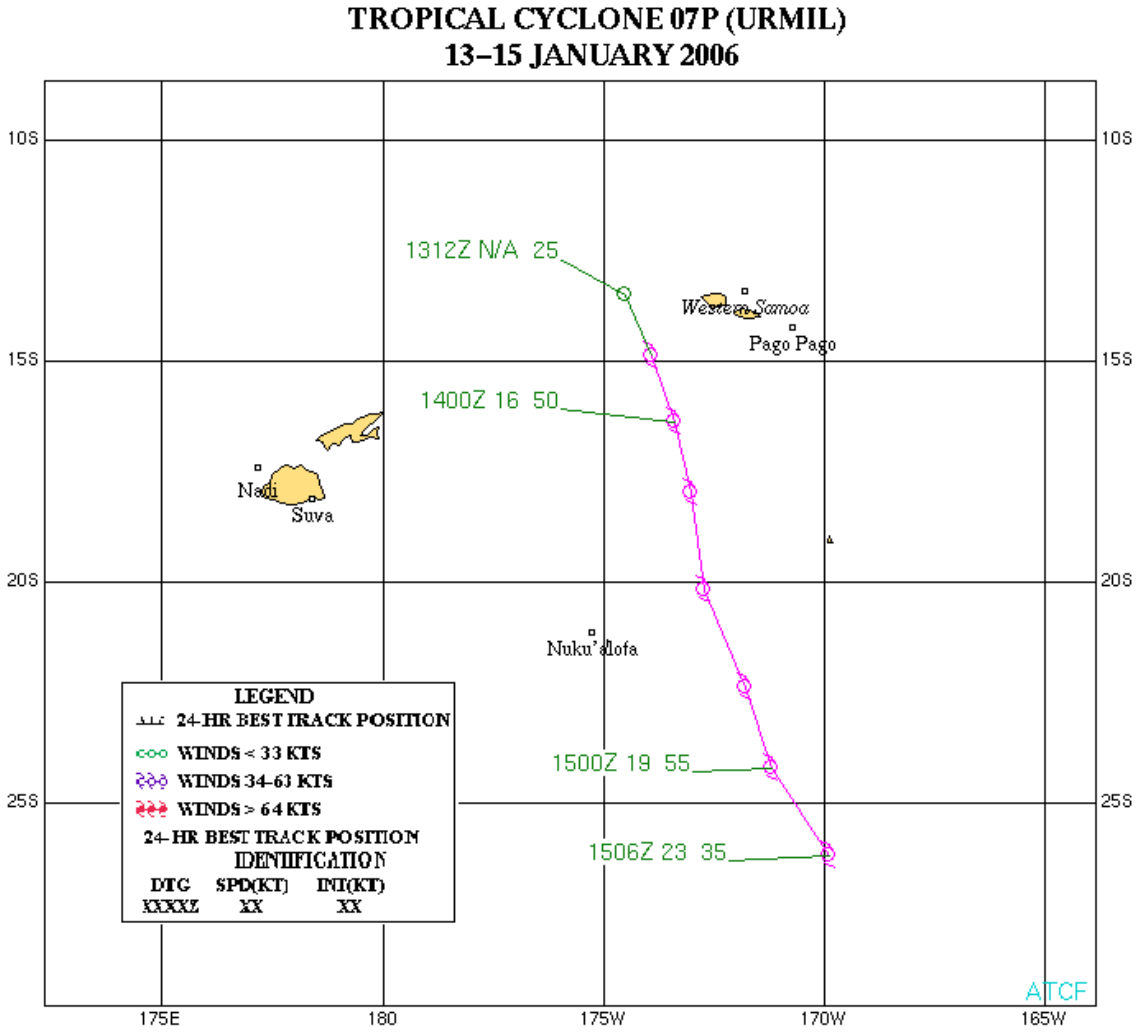
First Poor: 110600Z JAN 06
First Fair: 121400Z JAN 06
First TCFA: 140230Z JAN 06
First Warning: 140900Z JAN 06
Last Warning: 150600Z JAN 06
Max Intensity: 40 kts, gusts to 50 kts
Total Warnings: 3

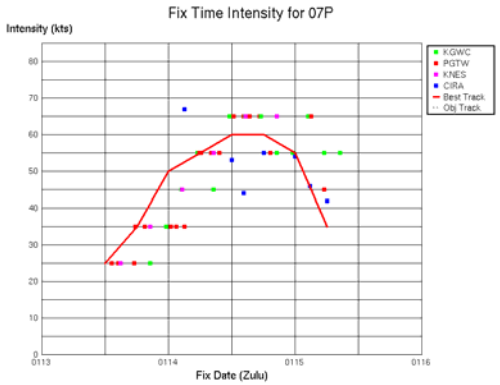




TROPICAL CYCLONE (TC) 07P (URMIL)

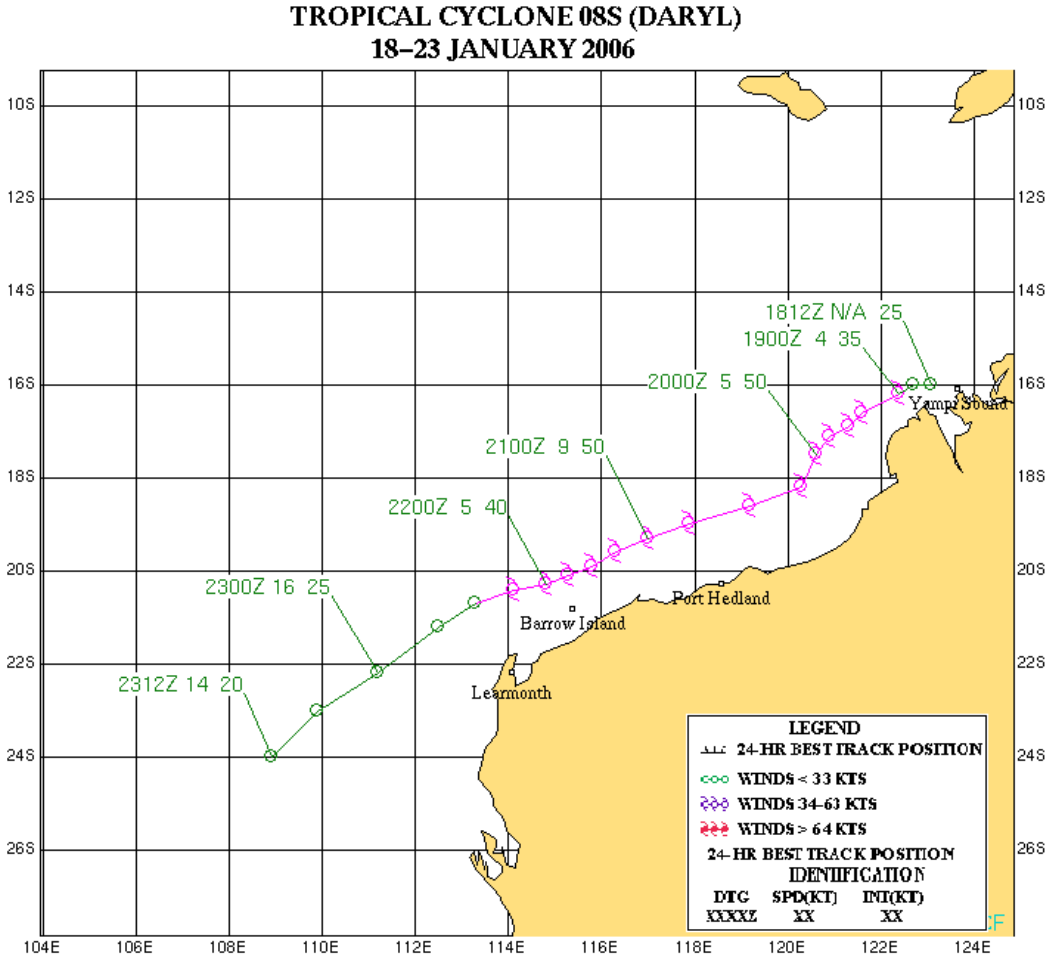
First Poor: 151200Z JAN 06
First Fair: 181800Z JAN 06
First TCFA: 182030Z JAN 06
First Warning: 140900Z JAN 06
Last Warning: 150600Z JAN 06
Max Intensity: 60 kts, gusts to 75 kts
Total Warnings: 3

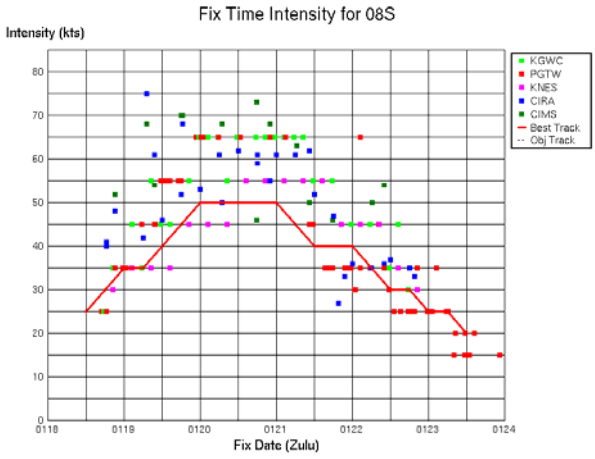




TROPICAL CYCLONE (TC) 08S (DARYL)

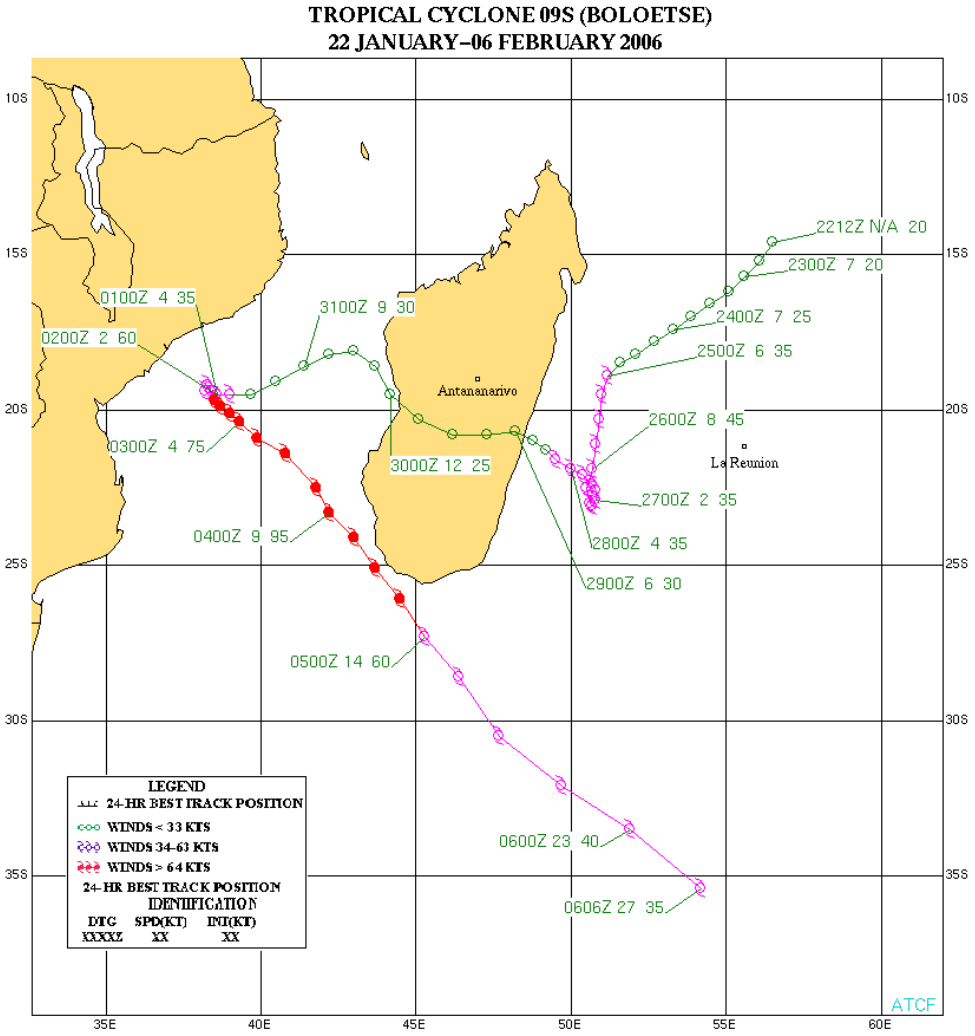
First Poor: 181400Z JAN 06
First Fair: 181800Z JAN 06
First TCFA: 182030Z JAN 06
First Warning: 190000Z JAN 06
Last Warning: 221200Z JAN 06
Max Intensity: 50 kts, gusts to 65 kts
Total Warnings: 14

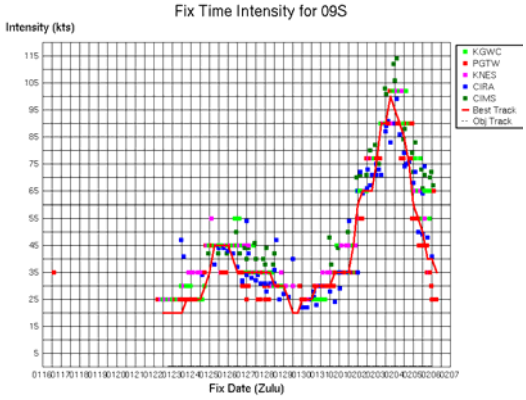




TROPICAL CYCLONE (TC) 09S (BOLOETSE)

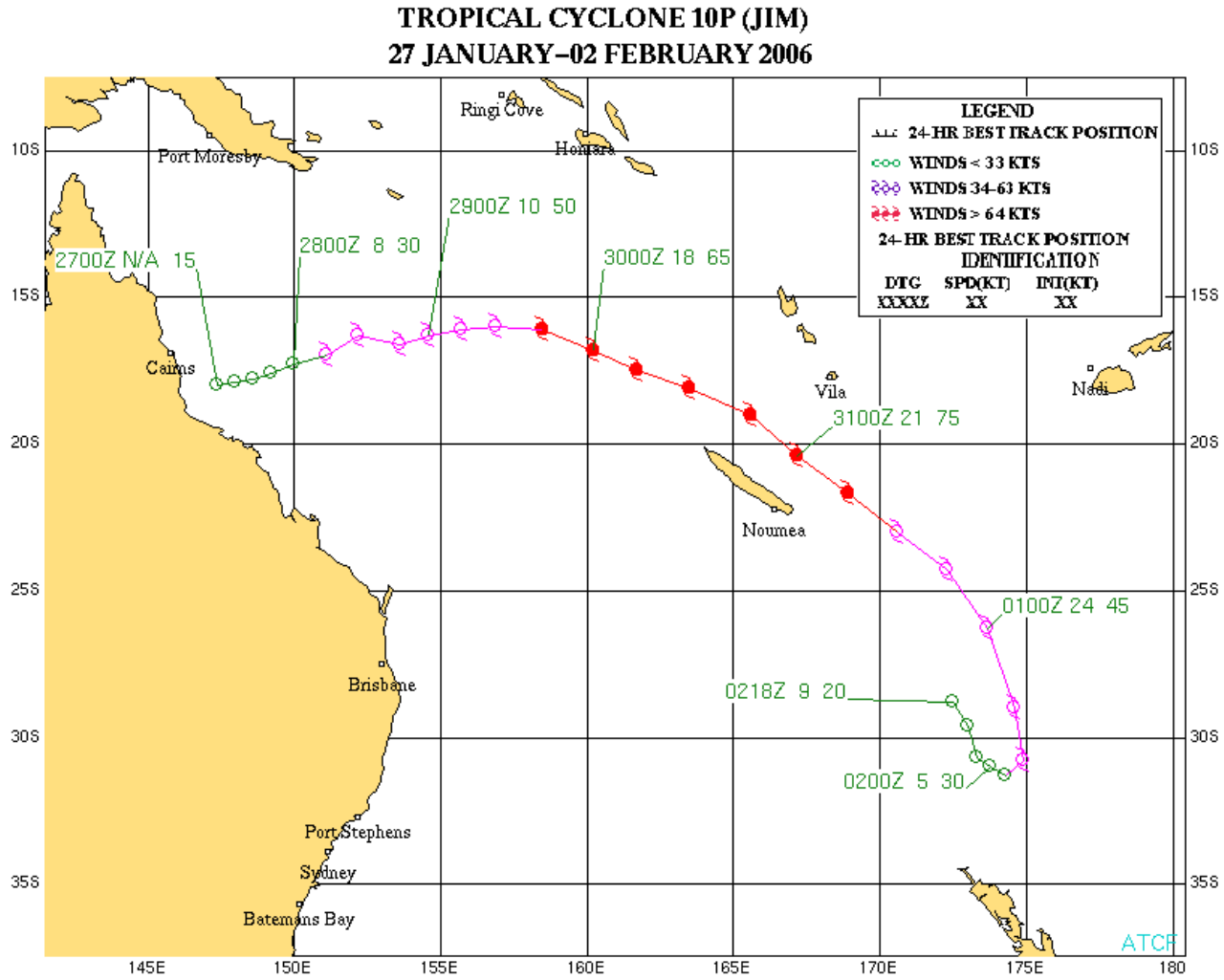
First Poor: 231800Z JAN 06
First Fair: 241800Z JAN 06
First TCFA: 242330Z JAN 06
First Warning: 250000Z JAN 06
Last Warning: 290300Z JAN 06
Max Intensity: 100 kts, gusts to 125 kts
Total Warnings: 29

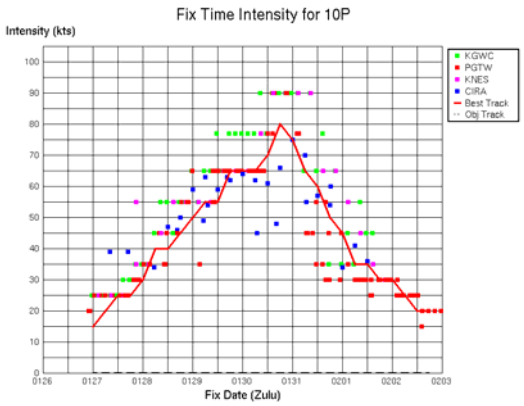




TROPICAL CYCLONE (TC) 10P (JIM)

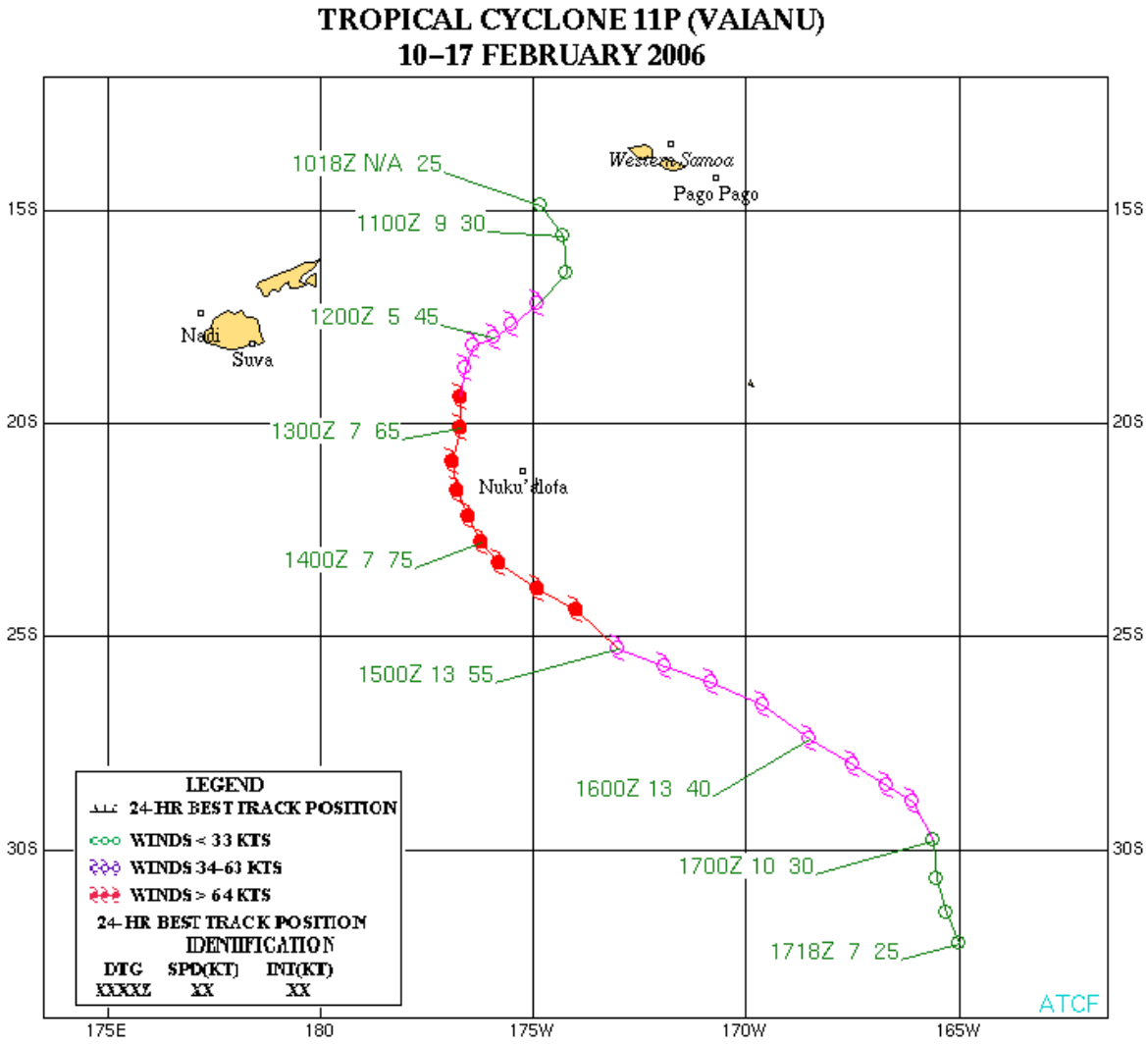
First Poor: 270000Z JAN 06
First Fair: 271430Z JAN 06
First TCFA: 272130Z JAN 06
First Warning: 280000Z JAN 06
Last Warning: 011200Z FEB 06
Max Intensity: 80 kts, gusts to 100 kts
Total Warnings: 14

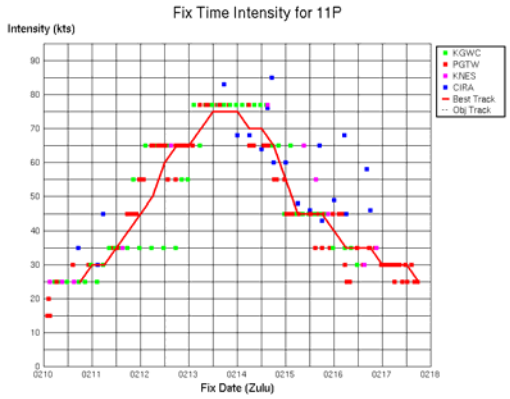




TROPICAL CYCLONE (TC) 11P (VAIANU)

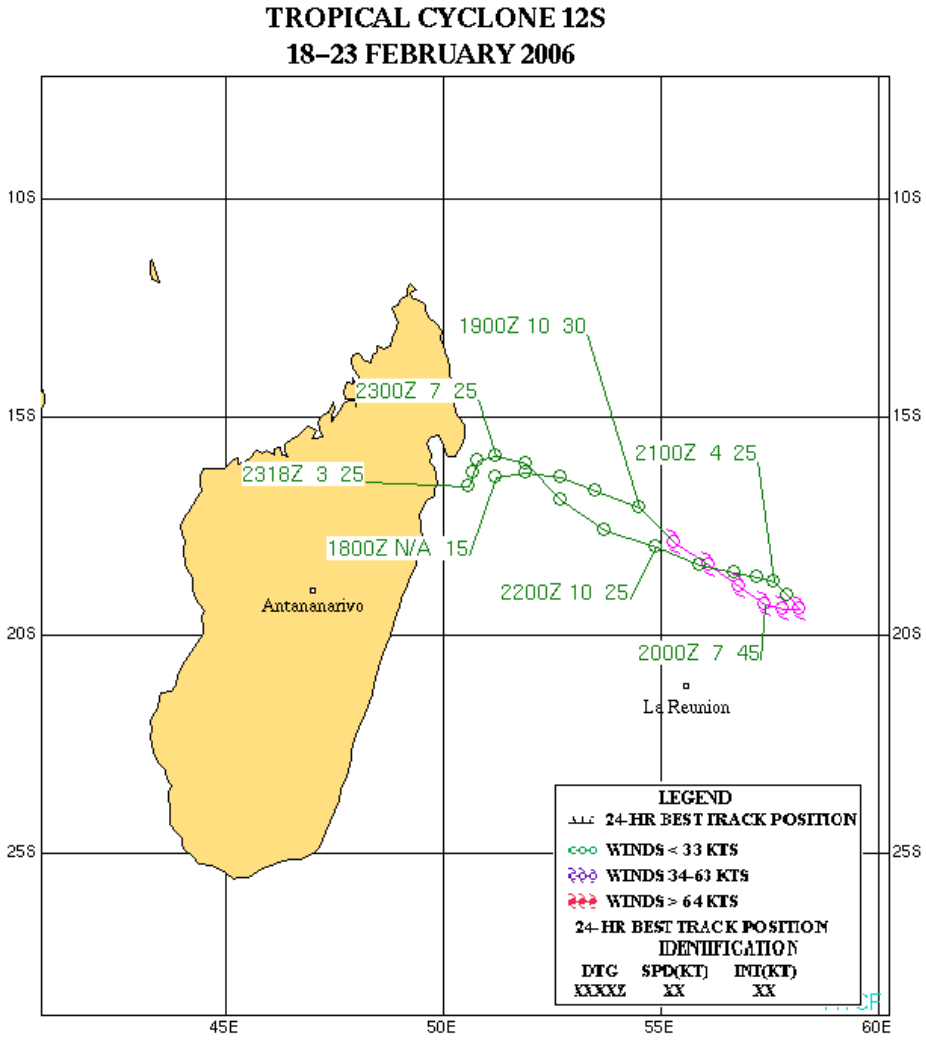
First Poor: 090600Z FEB 06
First Fair: N/A
First TCFA: 092030Z FEB 06
First Warning: 111200Z FEB 06
Last Warning: 160600Z FEB 06
Max Intensity: 75 kts, gusts to 90 kts
Total Warnings: 11

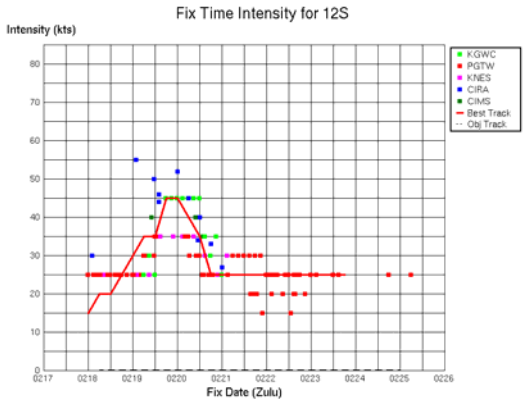




TROPICAL CYCLONE (TC) 12S

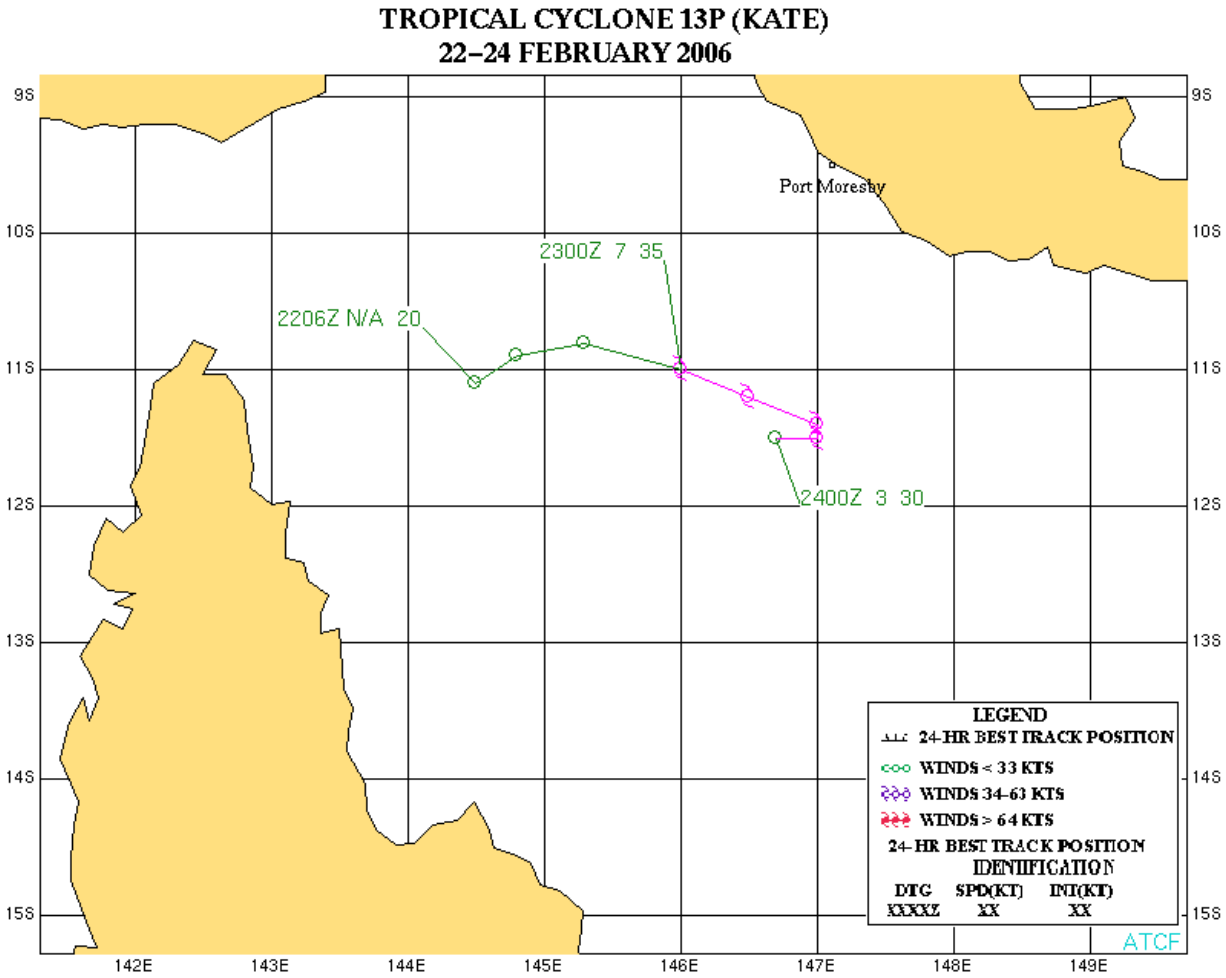
First Poor: 181030Z FEB 06
First Fair: 190730Z FEB 06
First TCFA: 191430Z FEB 06
First Warning: 191800Z FEB 06
Last Warning: 201800Z FEB 06
Max Intensity: 45 kts, gusts to 55 kts
Total Warnings: 3

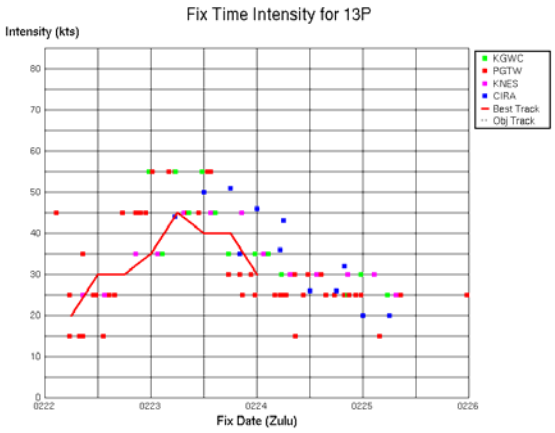




TROPICAL CYCLONE (TC) 13P (KATE)

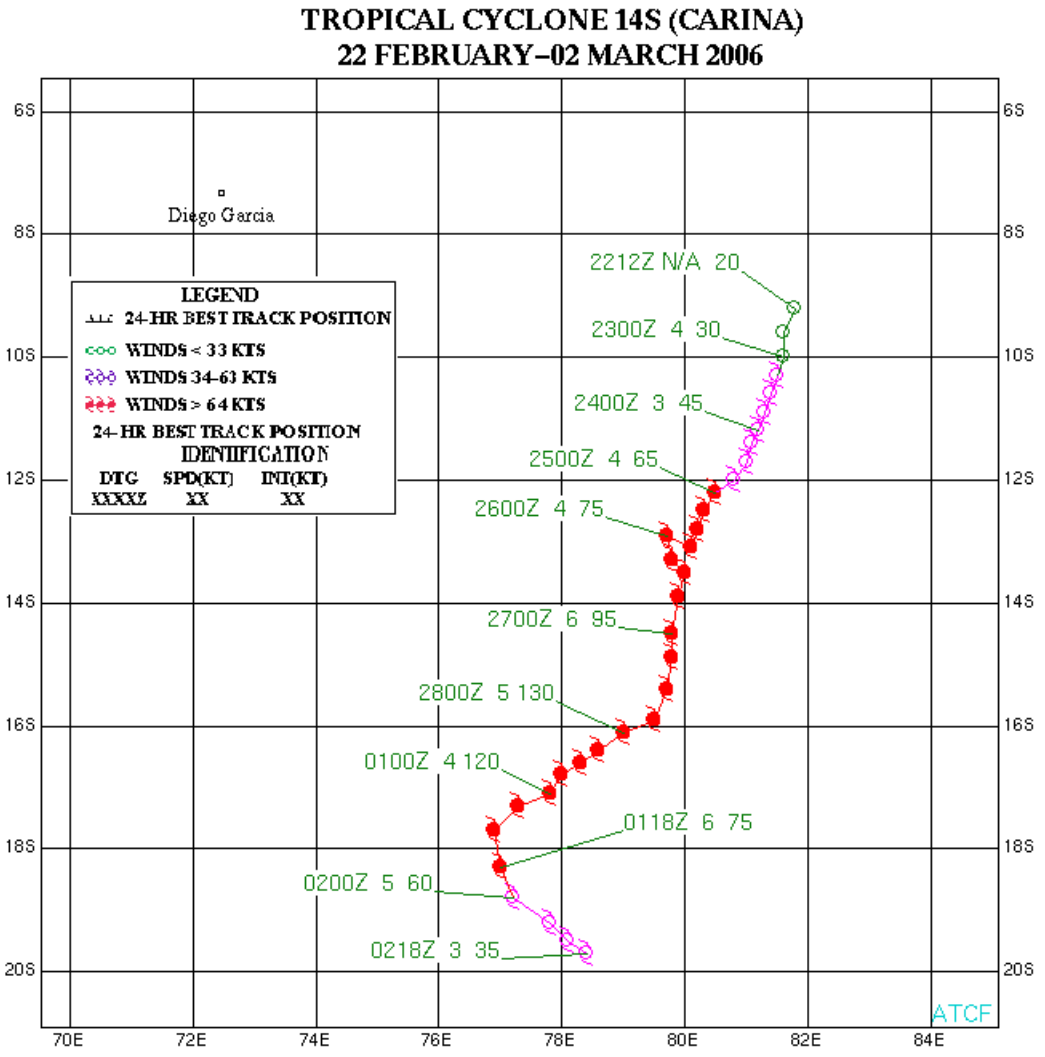
First Poor: 220600Z FEB 06
First Fair: N/A
First TCFA: N/A
First Warning: 221800Z FEB 06
Last Warning: 240600Z FEB 06
Max Intensity: 55 kts, gusts to 70 kts
Total Warnings: 4

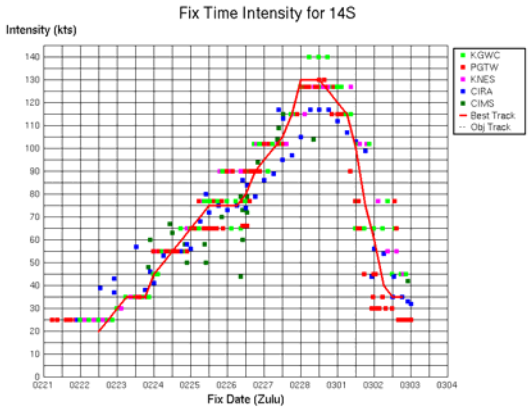




TROPICAL CYCLONE (TC) 14S (CARINA)

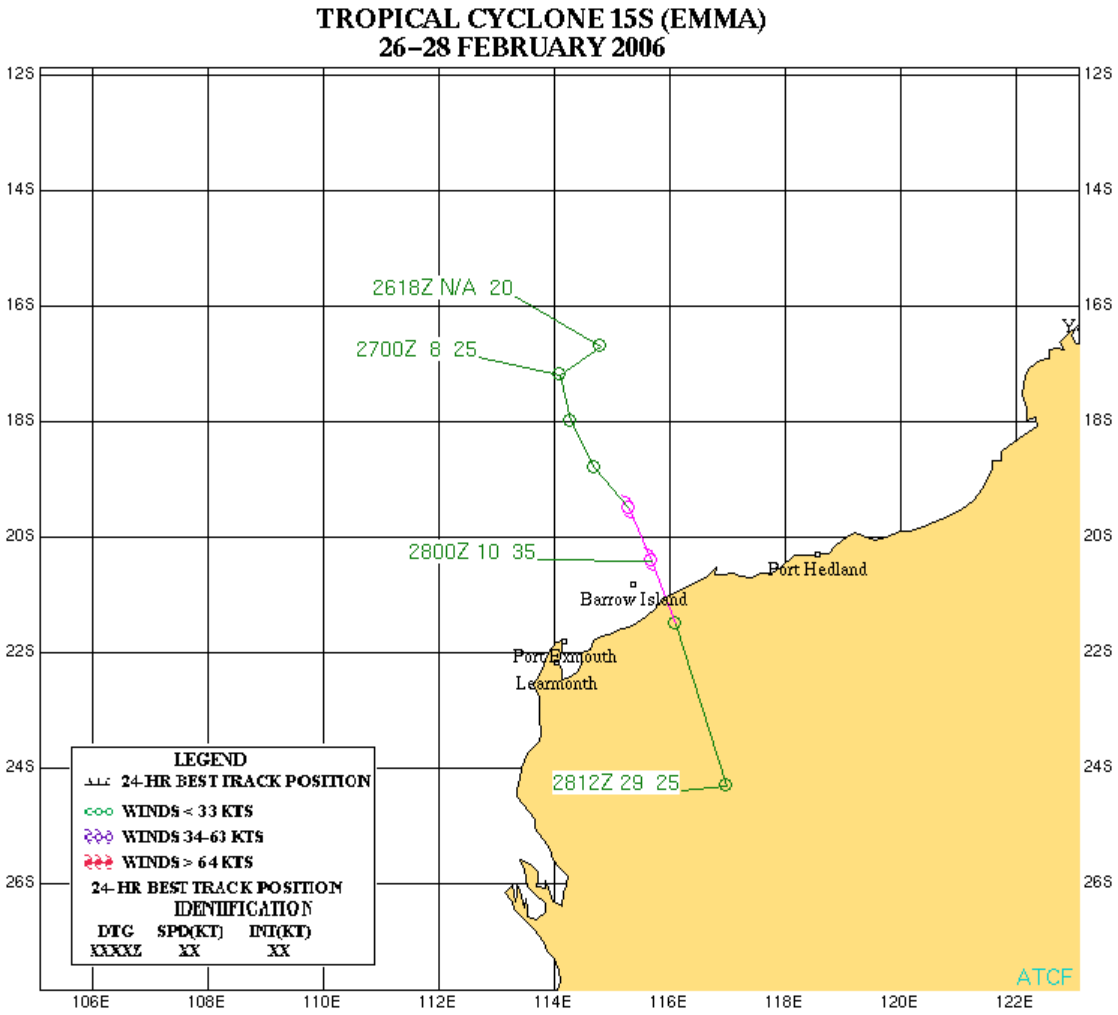
First Poor: 211800Z FEB 06
First Fair: 220100Z FEB 06
First TCFA: 230000Z FEB 06
First Warning: 230600Z FEB 06
Last Warning: 022100Z MAR 06
Max Intensity: 130 kts, gusts to 160 kts
Total Warnings: 16

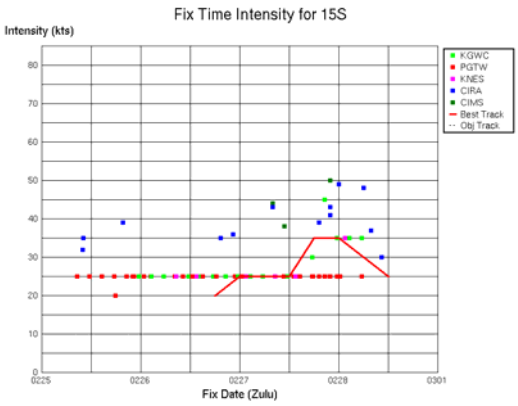




TROPICAL CYCLONE (TC) 15S (EMMA)

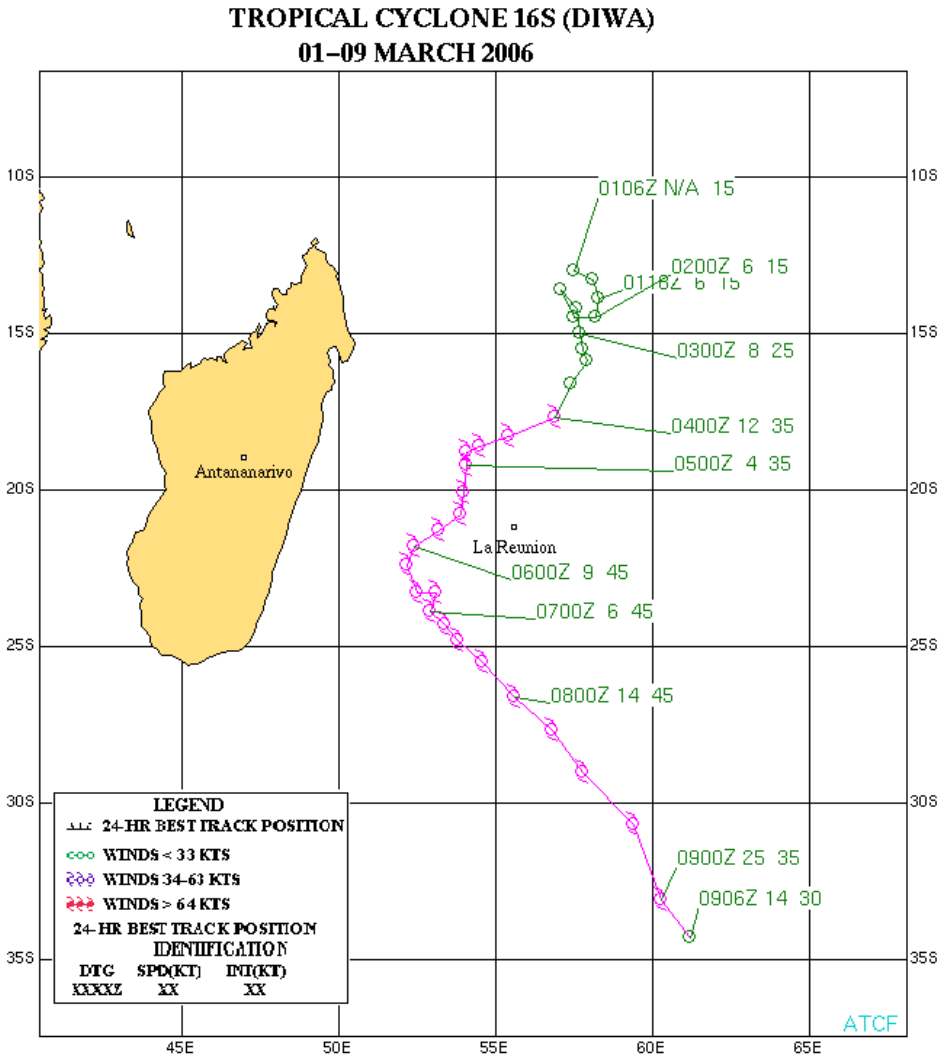
First Poor: N/A
First Fair: 252200Z FEB 06
First TCFA: N/A
First Warning: 271800Z FEB 06
Last Warning: 280900Z FEB 06
Max Intensity: 35 kts, gusts to 45 kts
Total Warnings: 2

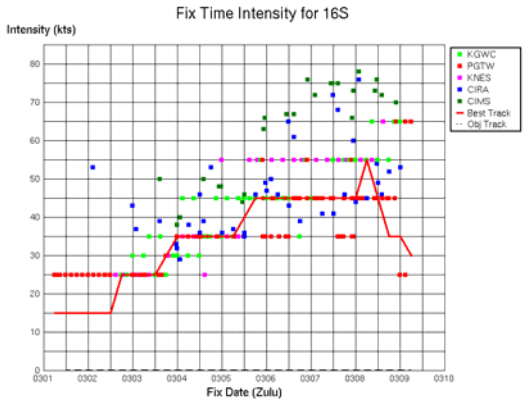




TROPICAL CYCLONE (TC) 16S (DIWA)

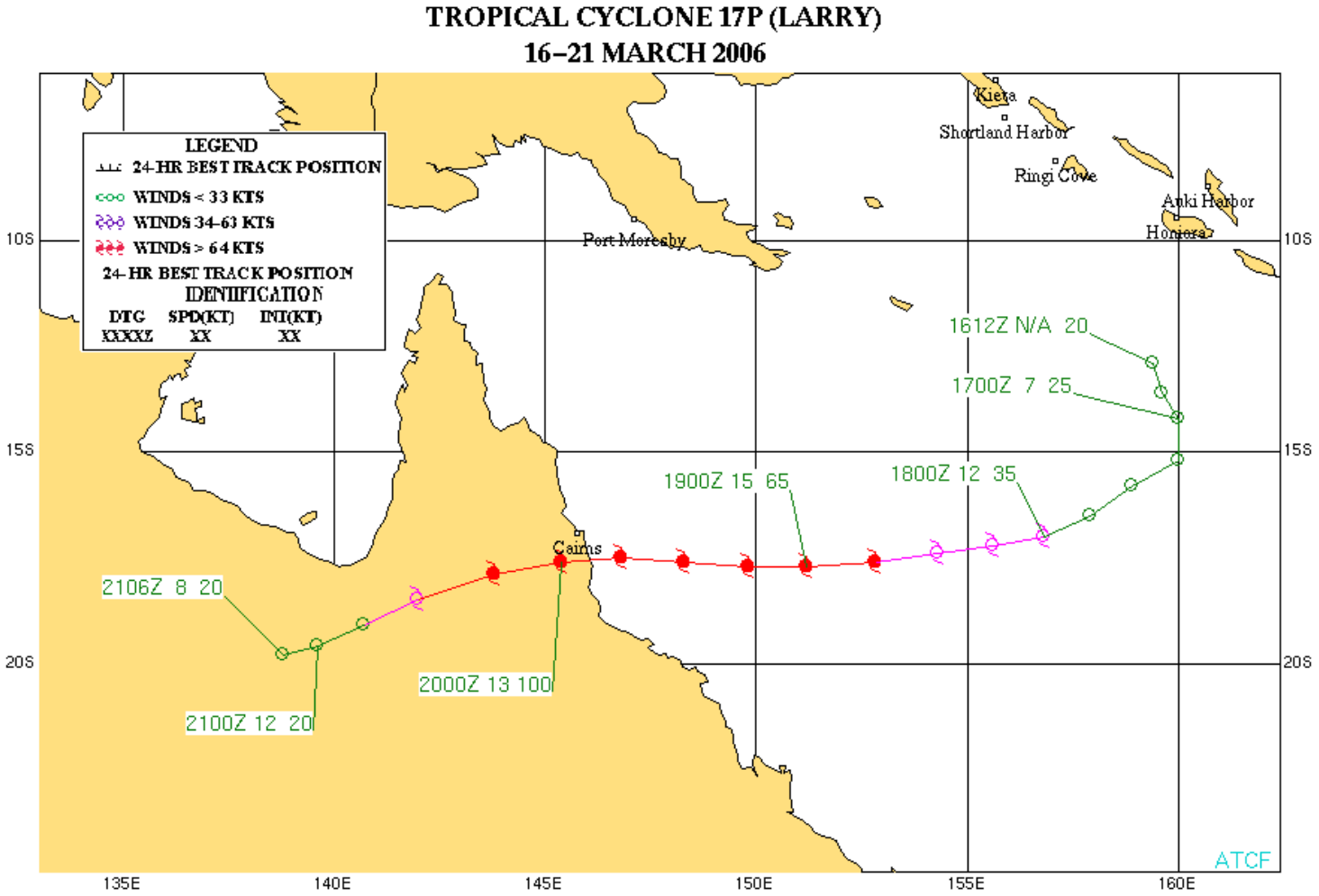
First Poor: 020100Z MAR 06
First Fair: 021800Z MAR 06
First TCFA: 032200Z MAR 06
First Warning: 040300Z MAR 06
Last Warning: 082100Z MAR 06
Max Intensity: 55 kts, gusts to 70 kts
Total Warnings: 11

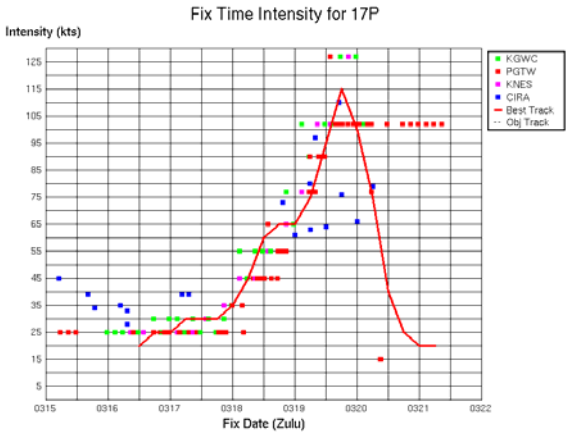




TROPICAL CYCLONE (TC) 17P (LARRY)

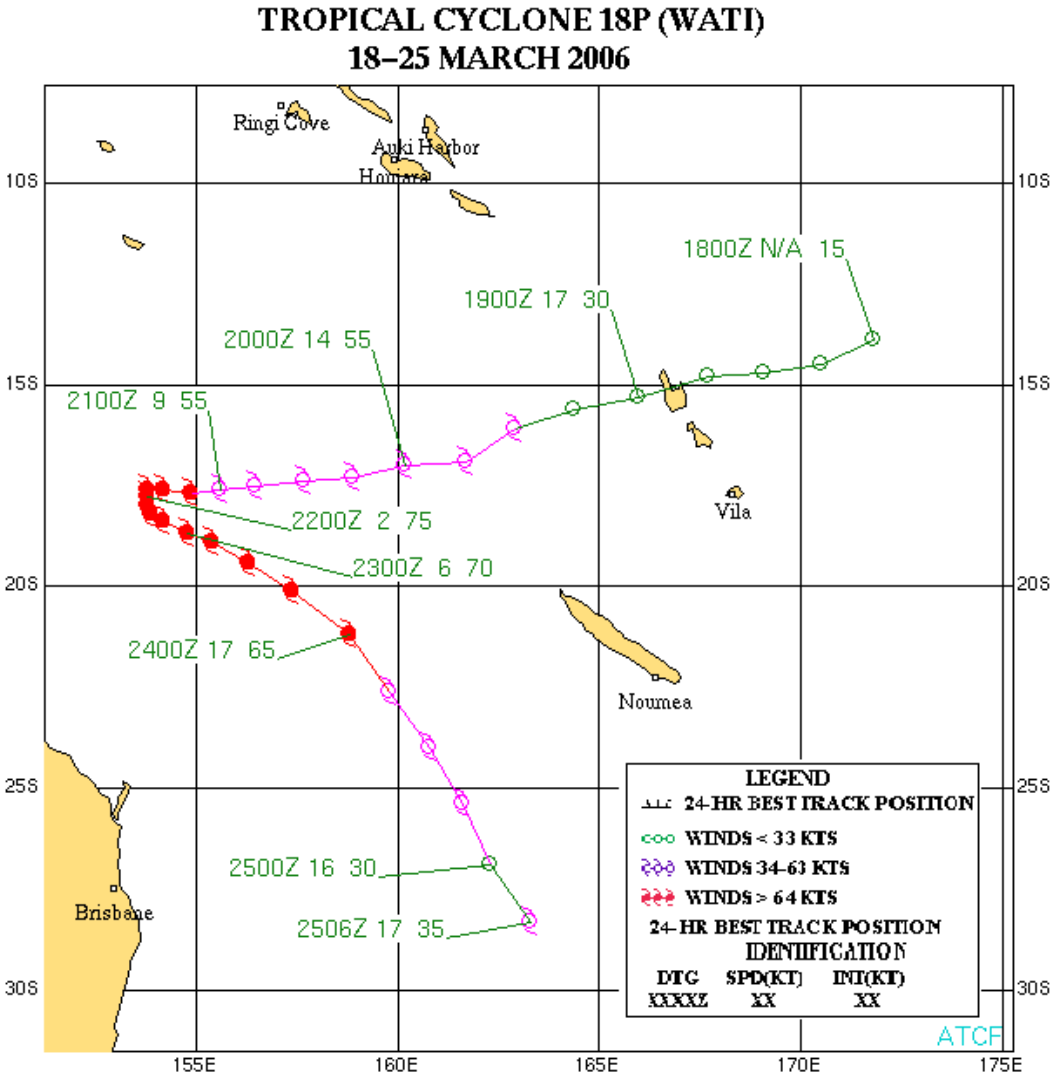
First Poor: 150600Z MAR 06
First Fair: 161330Z MAR 06
First TCFA: 172130Z MAR 06
First Warning: 180300Z MAR 06
Last Warning: 200900Z MAR 06
Max Intensity: 115 kts, gusts to 140 kts
Total Warnings: 10

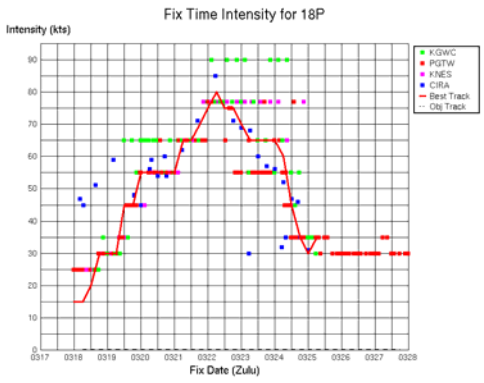




TROPICAL CYCLONE (TC) 18P (WATI)

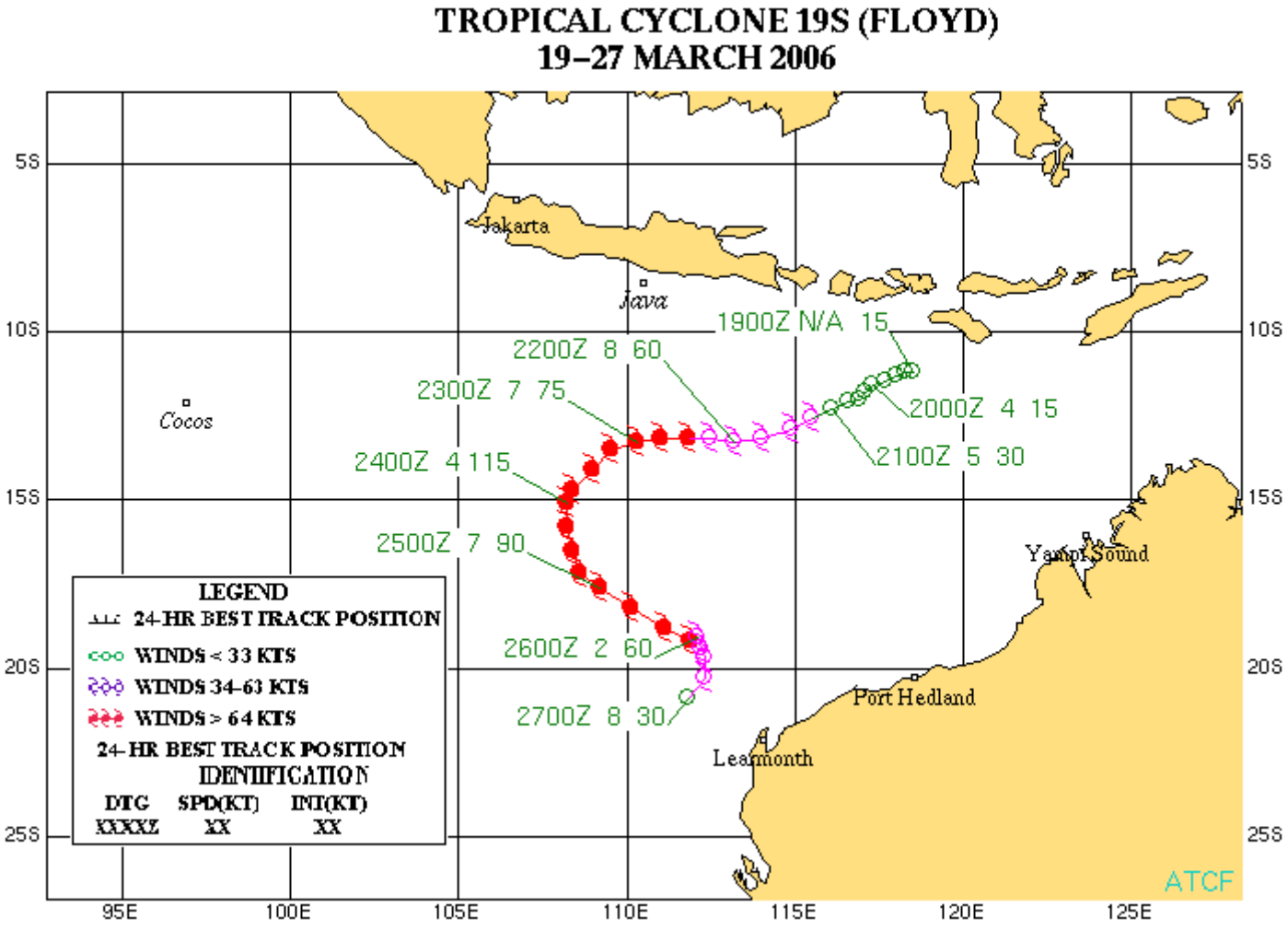
First Poor: 181230Z MAR 06
First Fair: 190130Z MAR 06
First TCFA: 190800Z MAR 06
First Warning: 191500Z MAR 06
Last Warning: 240900Z MAR 06
Max Intensity: 80 kts, gusts to 100 kts
Total Warnings: 21

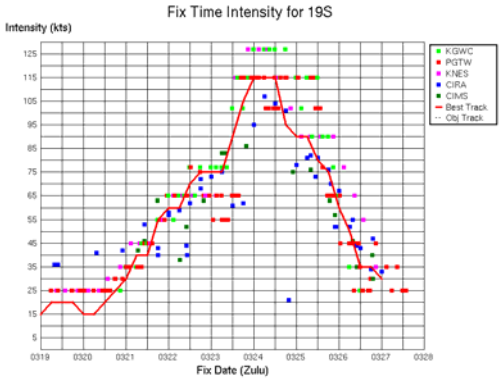




TROPICAL CYCLONE (TC) 19S (FLOYD)

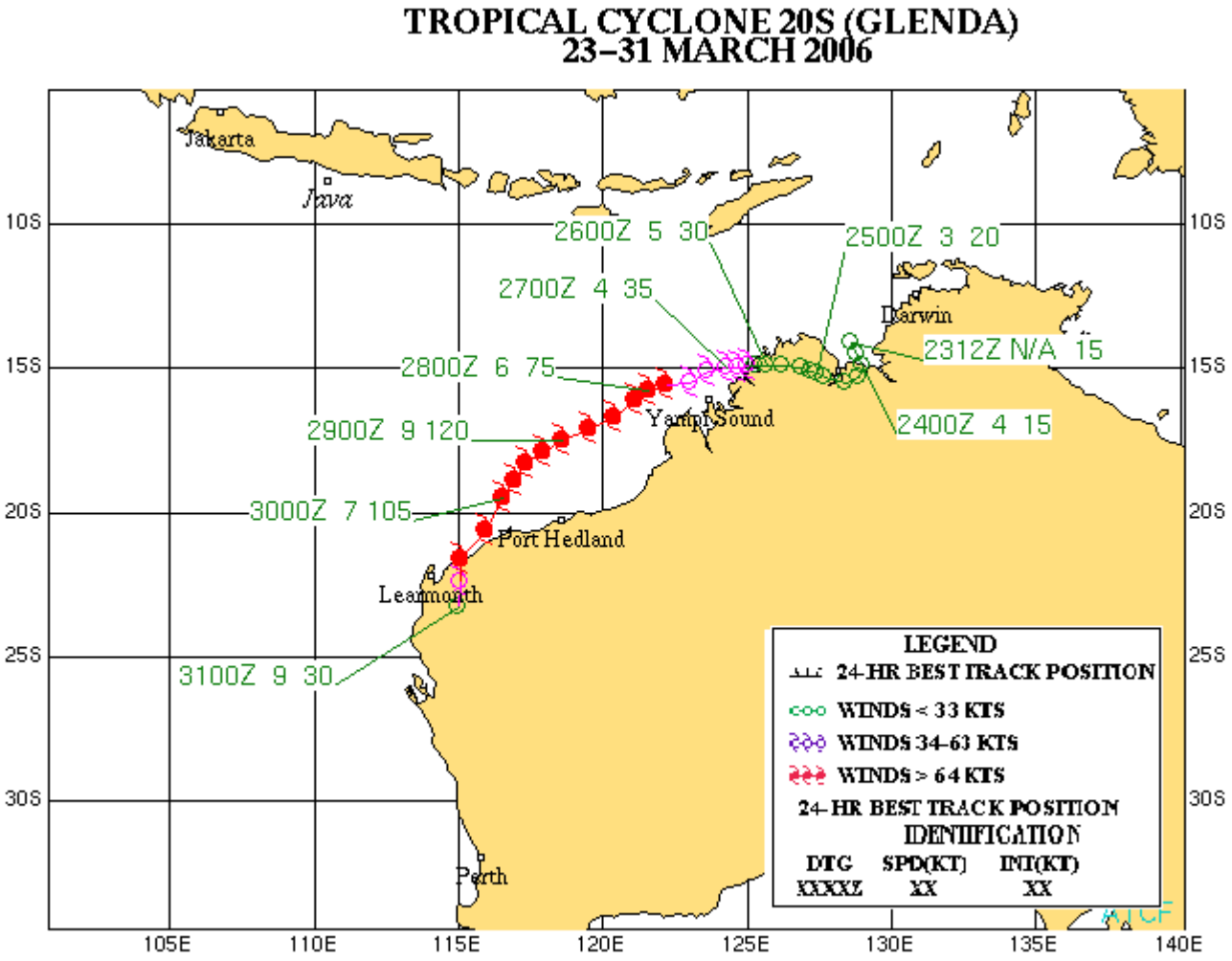
First Poor: 191800Z MAR 06
First Fair: 201800Z MAR 06
First TCFA: 210230Z MAR 06
First Warning: 210900Z MAR 06
Last Warning: 262100Z MAR 06
Max Intensity: 115 kts, gusts to 140 kts
Total Warnings: 21

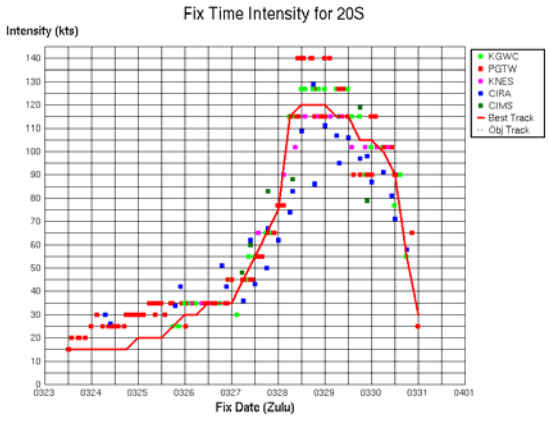




TROPICAL CYCLONE (TC) 20S (GLENDA)

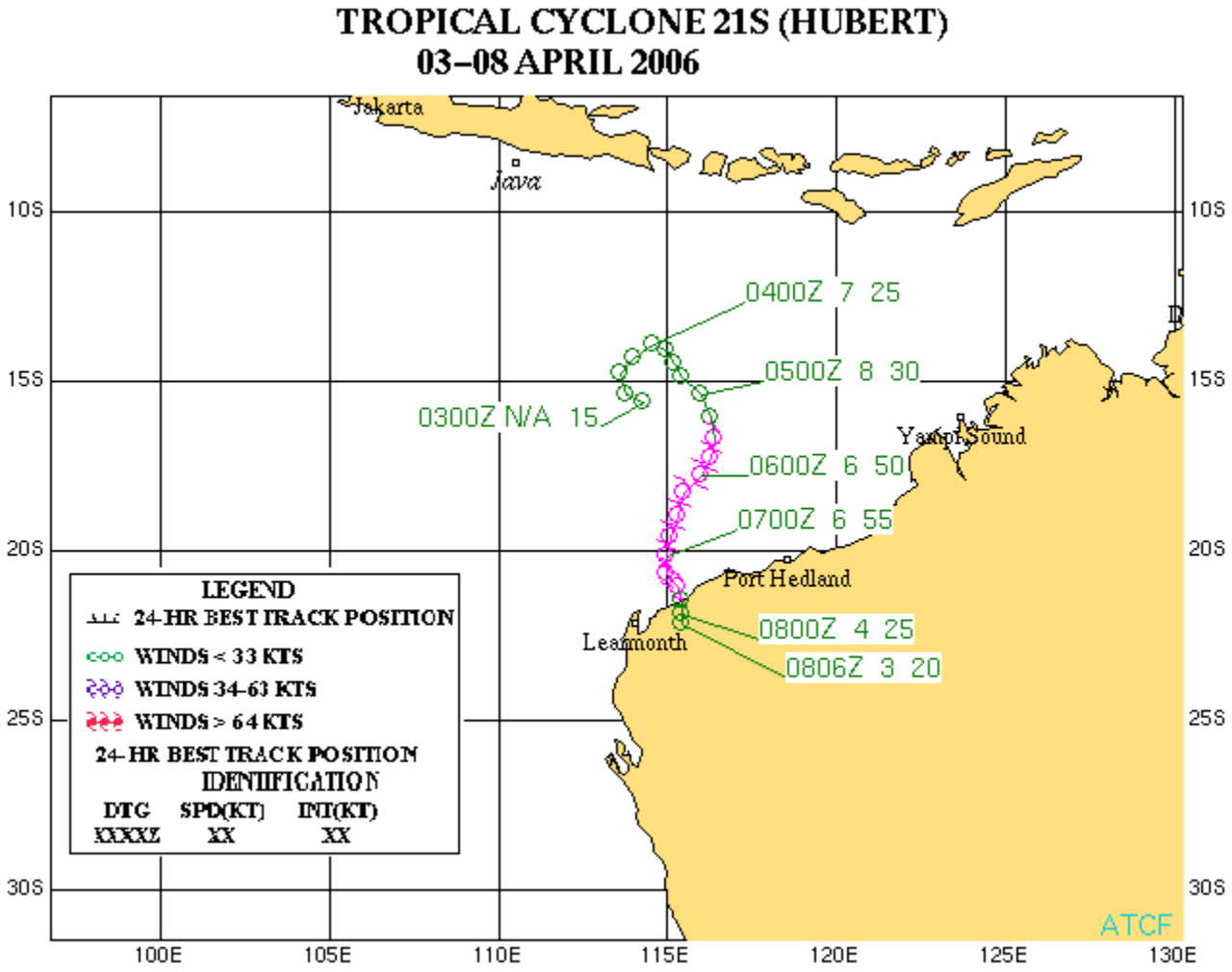
First Poor: 250100Z MAR 06
First Fair: 251800Z MAR 06
First TCFA: 260000Z MAR 06
First Warning: 270300Z MAR 06
Last Warning: 301500Z MAR 06
Max Intensity: 120 kts, gusts to 145 kts
Total Warnings: 14

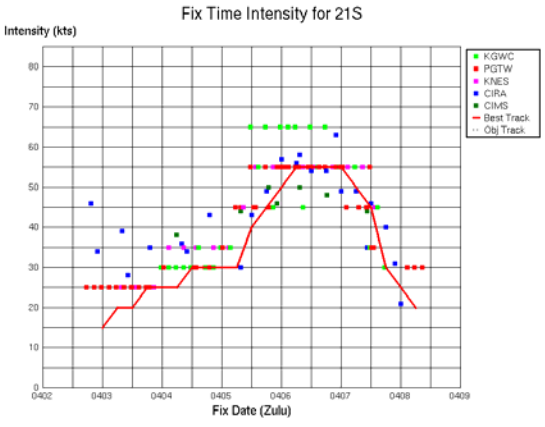




TROPICAL CYCLONE (TC) 21S (HUBERT)

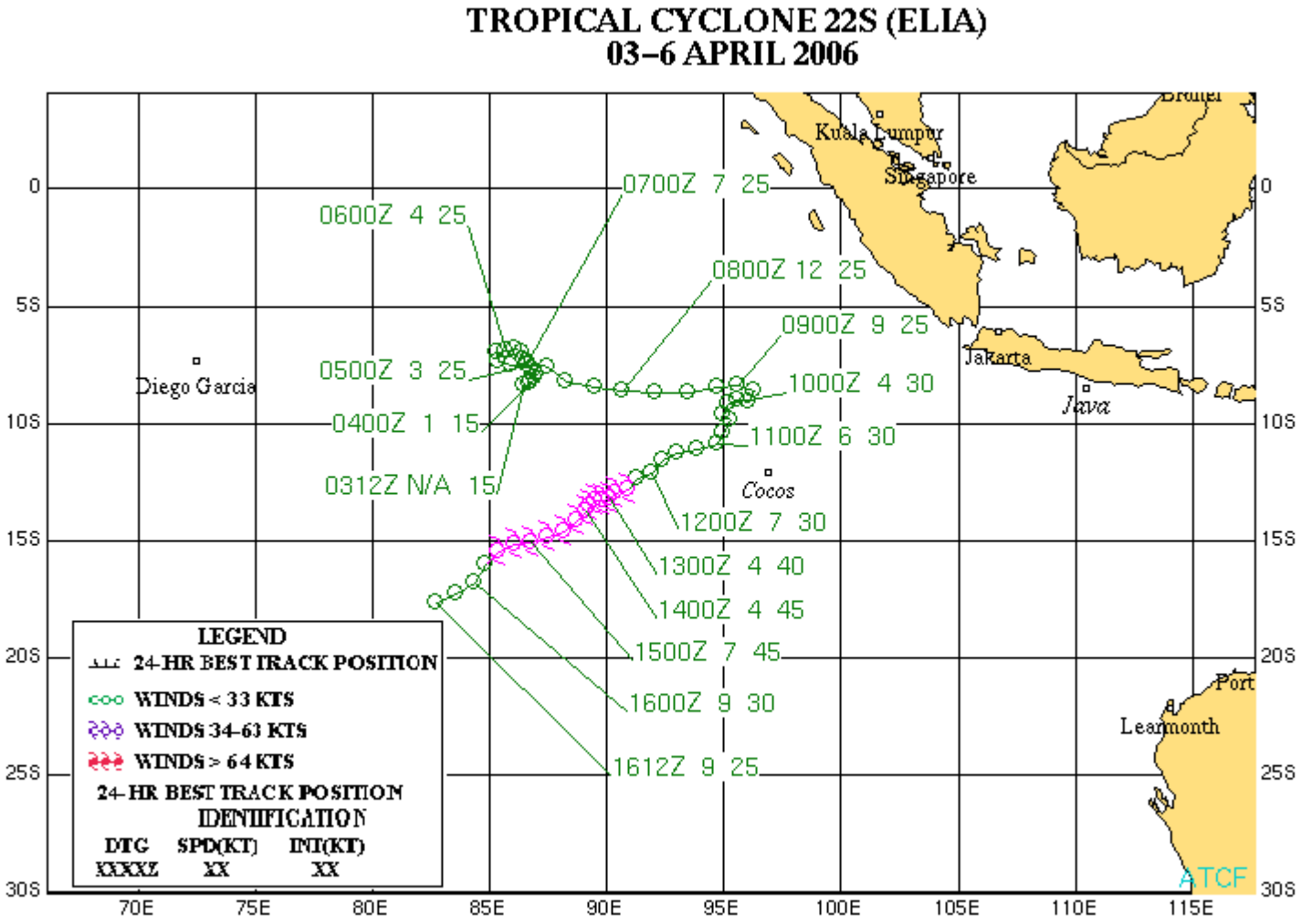
First Poor: 021800Z APR 06
First Fair: 040100Z APR 06
First TCFA: 042030Z APR 06
First Warning: 050900Z APR 06
Last Warning: 072100Z APR 06
Max Intensity: 55 kts, gusts to 70 kts
Total Warnings: 11

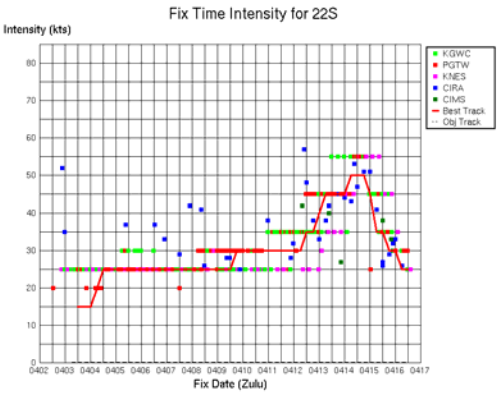




TROPICAL CYCLONE (TC) 22S (ELIA)

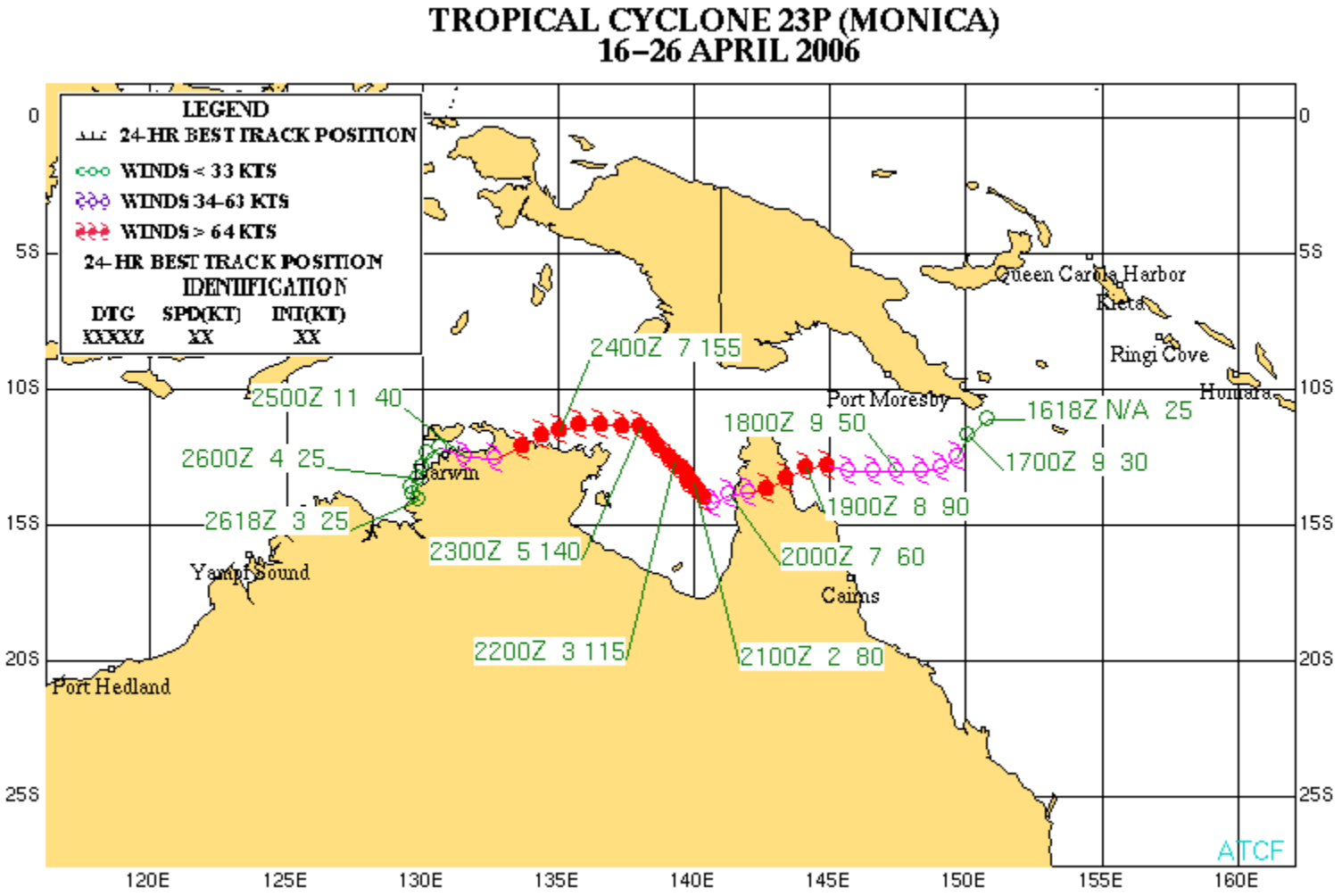
First Poor: 051800Z APR 06
First Fair: 161330Z APR 06
First TCFA: N/A
First Warning: 121500Z APR 06
Last Warning: 242100Z APR 06
Max Intensity: 50 kts, gusts to 65 kts
Total Warnings: 7

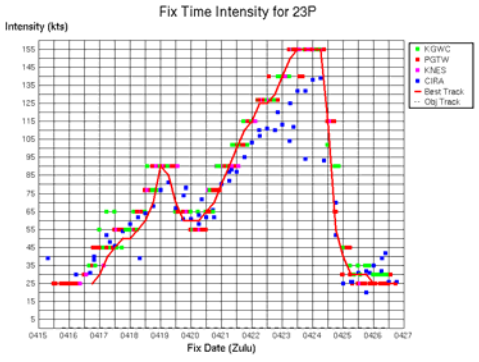




TROPICAL CYCLONE (TC) 23P (MONICA)

First Poor: 151430Z APR 06
First Fair: 161330Z APR 06
First TCFA: N/A
First Warning: 170300Z APR 06
Last Warning: 242100Z APR 06
Max Intensity: 155 kts, gusts to 190 kts
Total Warnings: 17





3. TROPICAL CYCLONE FIX DATA

2006 SEASON

Tables 3-1 to 3-3 list the number of tropical cyclone center "fixes", or locations, made using satellite (visible, infrared, and microwave), radar, and synoptic data. Fixes made by the DOD tropical cyclone reconnaissance network sites are included in the tables as well as those fixes received from other sources (e.g., Japan Meteorological Agency, Australian Bureau of Meteorology, and U.S. National Weather Service National Environmental Satellite Data and Information Service). Table 3-4 lists the total fixes by basin.

Table 3-1 WESTERN NORTH PACIFIC OCEAN FIX SUMMARY FOR 2006

TC	Name	Satellite	Radar	Synoptic	Total
TS 01W	-	200	0	0	200
STY 02W	Chanchu	422	0	0	422
TS 03W	Jelawat	194	0	0	194
STY 04W	Ewiniar	487	58	0	545
TS 05W	Bilis	275	0	0	275
TY 06W	Kaemi	355	98	0	453
TY 07W	Prapiroon	281	0	0	281
STY 08W	Saomai	280	91	0	371
TS 09W	Maria	237	57	0	294
TS 10W	Bopha	230	94	0	324
TS 11W	Wukong	326	110	0	436
TS 12W	Sonamu	110	0	0	110
TD 13W	-	78	0	0	78
TY 14W	Shanshan	375	153	0	528
TD 15W	-	42	0	0	42
STY 16W	yagi	379	0	0	379
TS 17W	-	135	0	0	135
TY 18W	Xangsane	294	0	0	294
TS 19W	Bebinca	252	0	0	252
TS 20W	Rumbia	113	0	0	113
TY 21W	Soulik	325	0	0	325
STY 22W	Cimaron	509	0	0	509
TY 23W	Chebi	310	0	0	310
STY 24W	Durian	442	0	0	442
TY 25W	Utor	332	0	0	332
TD 26W	Trami	111	0	0	111
STY 01C	Ioke	803	0	0	803

	Total	7897	661	0	8558
Percentage of Total		92.28%	7.72%	0	100.00%

Table 3-2 NORTHERN INDIAN OCEAN FIX SUMMARY FOR 2006

TC	Name	Satellite	Radar	Synoptic	Total
TC 01A	-	168	0	0	168
TC 02B	Mala	202	0	0	202
TC 03B	-	40	0	0	40
TC 04A	Mukda	265	0	0	265
TC 05B	-	64	0	0	64
TC 06B	-	35	0	0	35
	Totals	774	0	0	774
Percentage of Total		100.00%	0	0	100.00%

Table 3-3 SOUTH PACIFIC & SOUTH INDIAN FIX SUMMARY FOR 2006

TC	Name	Satellite	Radar	Synoptic	Total
TC 01S	-	89	0	0	89
TC 02S	-	141	0	0	141
TC 03S	Bertie-Alvin	365	0	0	365
TC 04S	-	299	0	0	299
TC 05S	Clare	132	0	0	132
TC 06P	Tam	90	0	0	90
TC 07P	Urmil	68	0	0	67
TC 08S	Daryl	163	0	0	163
TC 09S	Boloetse	492	0	0	492
TC 10P	Jim	253	0	0	253
TC 11P	Vaianu	276	0	0	276
TC 12S	-	122	0	0	122
TC 13P	Kate	96	0	0	96
TC 14S	Carina	300	0	0	300
TC 15S	Emma	86	0	0	86
TC 16S	Diwa	234	0	0	234
TC 17P	Larry	163	0	0	163
TC 18P	Wati	286	0	0	286
TC 19S	Floyd	264	0	0	278
TC 20S	Glenda	225	0	0	225

TC 21S	Hubert	152	0	0	152
TC 22S	Elia	390	0	0	390
TC 23P	Monica	376	0	0	376
	Totals	5062	14	0	5076
Precentage of Total		99.72%	0.28%	0	100.00%

Table 3-4 FIXES BY OCEANIC BASIN FOR 2006

Oceanic Basin	Total Fixes
Northwest Pacific	8558
Northern Indian Ocean	774
Southern Hemisphere	5076
Total	14408

4. SUMMARY OF FORECAST VERIFICATION

4.1 ANNUAL FORECAST VERIFICATION

Verification of warning positions and intensities at initial, 12-, 24-, 48-, and 72-hour forecast periods are made against the final best track. The (scalar) track forecast, along-track and cross-track errors (illustrated in 4-1) were calculated for each verifying JTWC forecast. These data, in addition to a detailed summary for each tropical cyclone, are included in this chapter. This section summarizes verification data this year and contrasts it with annual verification statistics from previous years.

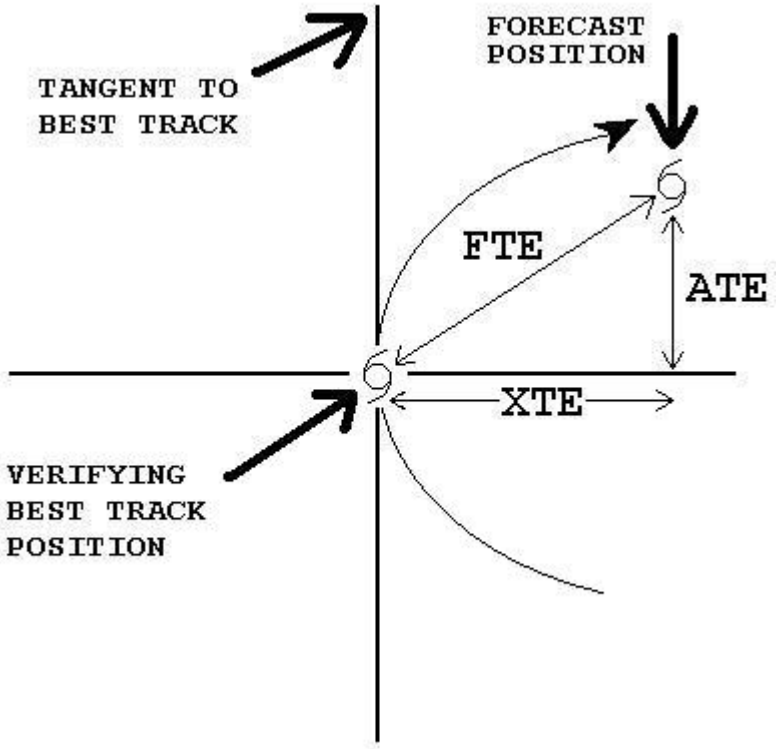


Figure 4-1. Definition of cross-track error (XTE), along-track error (ATE), and forecast track error (FTE). In this example, the forecast position is ahead of and to the right of the verifying best track position. Therefore, the XTE is positive (to the right of the best track) and the ATE is positive (ahead or faster than the best track). Adapted from Tsui and Miller, 1988.

4.1.1 WESTERN NORTH PACIFIC OCEAN

Table 4-1 includes mean track, along-track and cross-track errors from 1959, when JTWC was founded, until the present. Figure 4-2 shows mean track errors and a 5-year running mean of track errors at 24-, 48- and 72-hours since 1974.

Table 4-1 MEAN FORECAST TRACK ERRORS (NM) FOR WESTERN NORTH PACIFIC (TROPICAL CYCLONES FROM 1959-2006

	24-HOUR				48-HOUR				72-HOUR			
YEAR (Notes)	TY (1)	TC (3)	CROSS TRACK (2)	ALONG TRACK (2)	TY (1)	TC (3)	CROSS TRACK (2)	ALONG TRACK (2)	TY (1)	TC (3)	CROSS TRACK (2)	ALONG TRACK (2)

1959	117*				267*							
1960	177*				354*							
1961	136				274							
1962	144				287				476			
1963	127				246				374			
1964	133				284				429			
1965	151				303				418			
1966	136				280				432			
1967	125				276				414			
1968	105				229				337			
1969	111				237				349			
1970	98	104			181	190			272	279		
1971	99	111	64		203	212	118		308	317	177	
1972	116	117	72		245	245	146		382	381	210	
1973	102	108	74		193	197	134		245	253	162	
1974	114	120	78		218	226	157		357	348	245	
1975	129	138	84		279	288	181		442	450	290	
1976	117	117	71		232	230	132		336	338	202	
1977	140	148	83		266	283	157		390	407	228	
1978	120	127	71	87	241	271	151	194	459	410	218	296
1979	113	124	76	81	219	226	138	146	319	316	182	214
1980	116	126	76	86	221	243	147	165	362	389	230	266
1981	117	124	77	80	215	221	131	146	342	334	219	206
1982	114	113	70	74	229	238	142	162	337	342	211	223
1983	110	117	73	76	247	260	164	169	384	407	263	259
1984	110	117	64	84	228	232	131	163	361	363	216	238
1985	112	117	68	80	228	231	138	153	355	367	227	230
1986	117	126	70	85	261	261	151	183	403	394	227	276
1987	101	107	64	71	211	204	127	134	318	303	186	198
1988	107	114	58	85	222	216	103	170	327	315	159	244
1989	107	120	69	83	214	231	127	162	325	350	177	265
1990	98	103	60	72	191	203	110	148	299	310	168	225
1991	93	96	53	69	187	185	97	137	298	287	146	229
1992	97	107	59	77	194	205	116	143	295	305	172	210
1993	102	112	63	79	205	212	117	151	320	321	173	226
1994	96	105	56	76	172	186	105	131	244	258	152	176
1995	105	123	67	89	200	215	117	159	311	325	167	240
1996	85	105	56	76	157	178	89	134	252	272	137	203
1997	86	93	55	76	159	164	87	134	251	245	120	202
1998	127	124	58	98	263	239	127	178	392	370	201	274
1999	88	106	59	74	150	176	102	119	225	234	139	155
2000	75	81	45	57	136	142	80	98	205	209	118	144
2001	67	73	42	50	115	122	75	79	176	180	111	121
2002	47	66	45	39	87	115	78	70	131	163	109	100
2003	59	73	41	52	119	128	68	94	186	186	89	147
2004	52	70	41	48	94	122	69	84	180	173	95	121
2005	41	61	38	38	81	102	59	72	138	156	79	120

2006	45	62	39	40	85	104	61	73	133	151	77	112
Averages (1978-2006)	93	103	59	72	184	194	110	137	287	291	164	205
1. Track errors were calculated for typhoons when intensities were at least 65kts at warning times												
2. Cross-track and along-track errors were adopted by the JTWC in 1986. Right angle errors (used prior to 1986) were recomputed as cross-track errors after-the fact to extend the data base. See Figure 3-1 for the definitions of cross-track and along-track.												
3. Mean forecast errors for all warned systems in Northwest Pacific.												
*Forecast positions north of 35 degrees North latitude were not verified.												
**1994 statistics were recalculated to resolve earlier Along and Cross-Track discrepancies.												

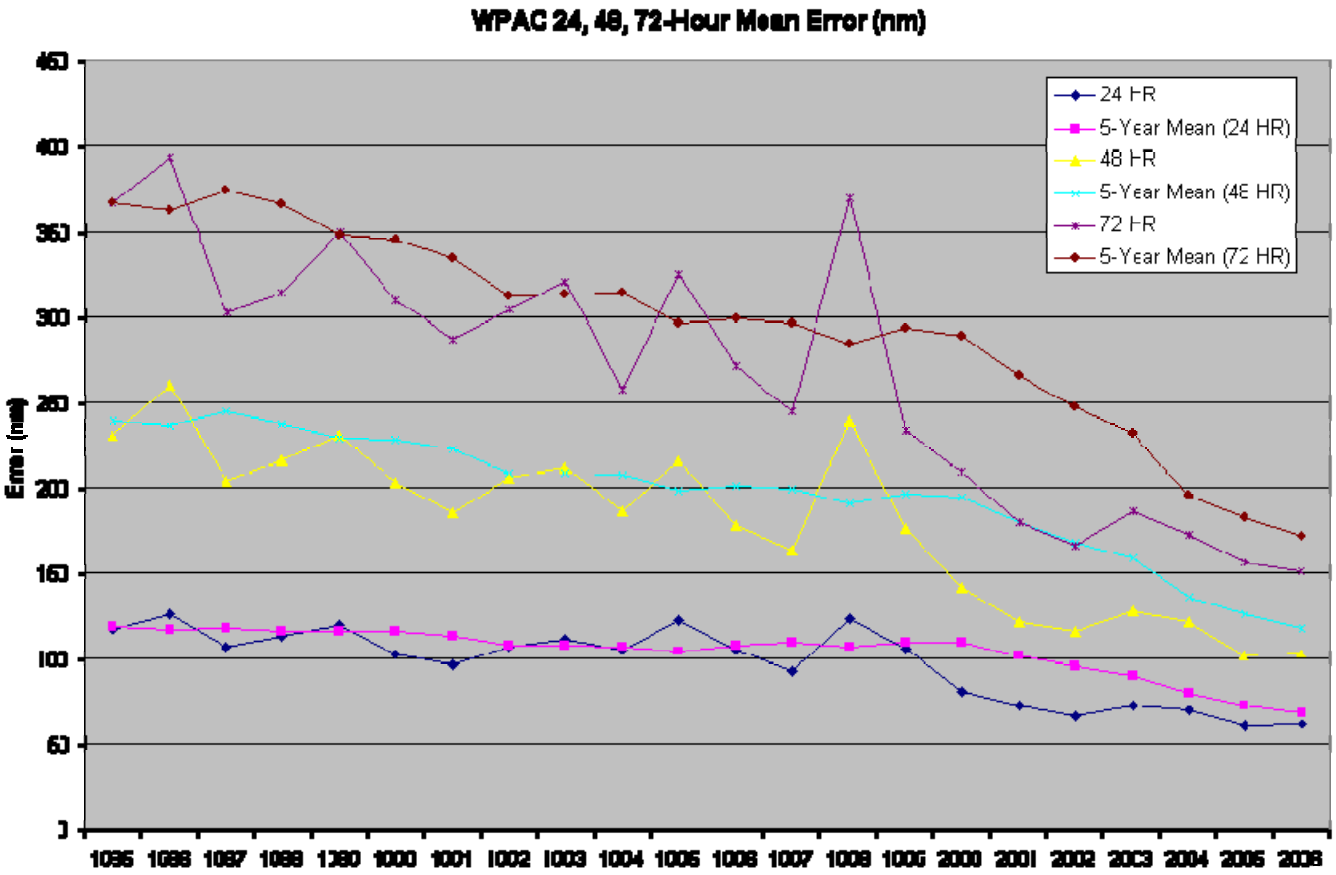


Figure 4-2. Mean track forecast error (nm) and 5-year running mean for 24, 48 and 72 hours for Western North Pacific Ocean tropical cyclones from 1985-2006.

Table 4-2 MEAN FORECAST TRACK ERRORS (NM) FOR NORTH INDIAN OCEAN (TROPICAL CYCLONES FROM 1985-2006

	24-HOUR				48-HOUR				72-HOUR			
YEAR (Notes)	Cases	Track	CROSS TRACK	ALONG TRACK	Cases	Track	CROSS TRACK	ALONG TRACK	Cases	Track	CROSS TRACK	ALONG TRACK
1985	30	122	102	53	8	242	119	194	0			
1986	16	134	118	53	7	168	131	80	5	269	189	180

1987	54	144	97	100	25	205	125	140	21	305	219	188
1988	30	120	89	63	18	219	112	176	12	409	227	303
1989	33	88	62	50	17	146	94	86	12	216	164	11
1990	36	101	85	43	24	146	117	67	17	185	130	104
1991	43	129	107	54	27	235	200	89	14	450	356	178
1992	149	128	73	86	100	244	141	166	62	398	276	218
1993	28	125	87	79	20	198	171	74	12	231	176	116
1994	44	97	80	44	28	153	124	63	13	213	177	92
1995	47	138	119	58	32	262	247	77	20	342	304	109
1996	123	134	94	80	85	238	181	127	58	311	172	237
1997	42	119	87	49	29	201	168	92	17	228	195	110
1998	55	106	84	51	34	198	135	106	17	262	188	144
1999	41	79	59	38	22	184	130	116	10	374	309	177
2000	24	61	47	26	16	85	69	37	1	401	399	38
2001	41	61	40	37	31	115	71	71	22	166	44	154
2002	30	84	41	63	18	137	92	83	10	185	92	133
2003	37	108	66	69	31	196	115	132	7	354	210	252
2004	46	81	53	52	36	140	95	85	9	173	144	86
2005	67	62	41	40	49	116	71	73	18	118	35	109
2006	19	64	37	44	13	92	58	60	0			
Averages (1985-2006)	47	104	55	77	30	177	98	126	18	277	141	204

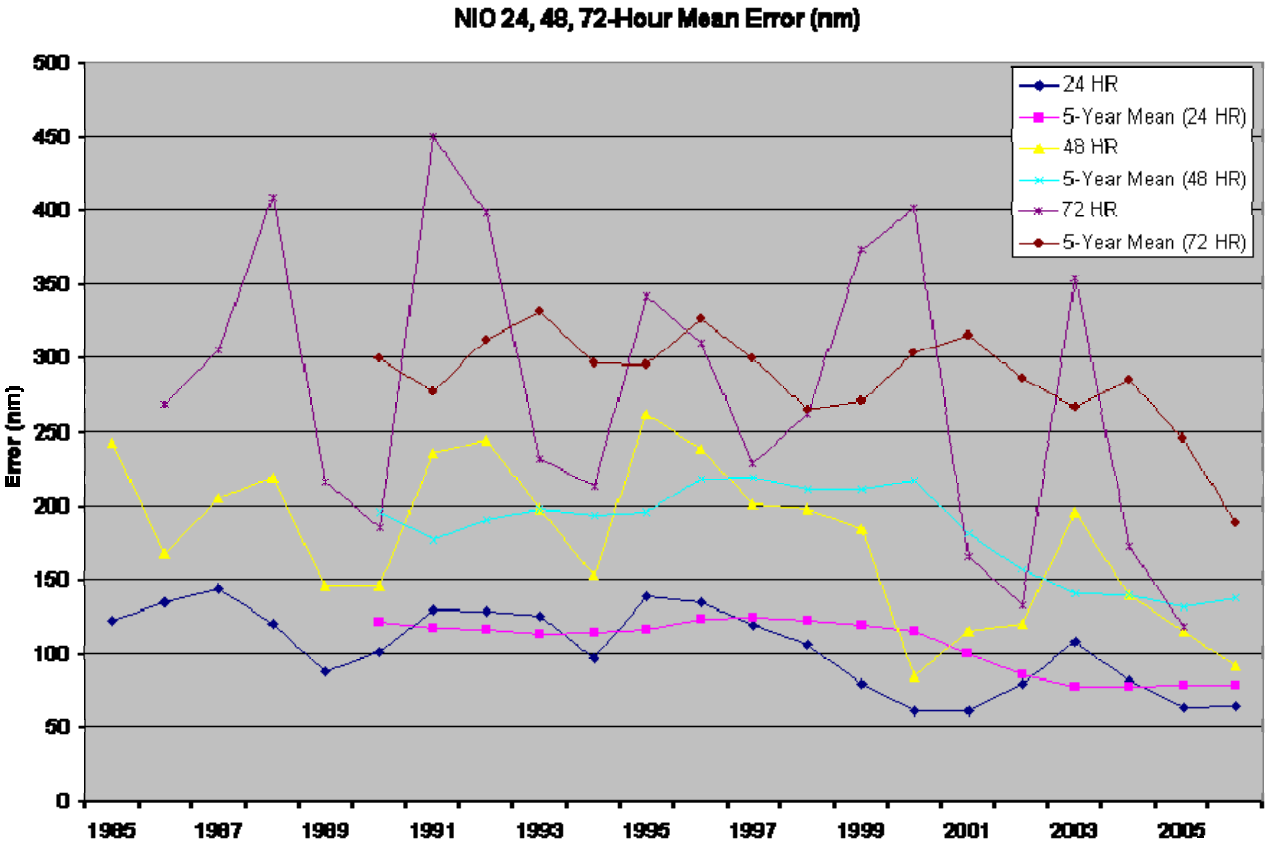


Figure 4-3. Mean track forecast error (nm) and 5-year running mean for 24, 48 and 72 hours for North Indian Ocean Tropical Cyclones from 1985-2006.

Table 4-3 MEAN FORECAST TRACK ERRORS (NM) FOR SOUTHERN HEMISPHERE (TROPICAL CYCLONES FROM 1985-2006

	24-HOUR				48-HOUR				72-HOUR			
YEAR (Notes)	Cases	Track	CROSS TRACK	ALONG TRACK	Cases	Track	CROSS TRACK	ALONG TRACK	Cases	Track	CROSS TRACK	ALONG TRACK
1985	257	134	92	79	193	236	169	132				
1986	227	129	86	77	171	262	169	164				
1987	138	145	94	90	101	280	153	138				
1988	99	146	98	83	48	290	246	144				
1989	242	124	84	73	186	240	166	136				
1990	228	143	105	74	177	263	178	152				
1991	231	115	75	69	185	220	152	129				
1992	230	124	91	64	208	240	177	129				
1993	225	102	74	57	176	199	142	114				
1994	345	115	77	68	282	224	147	134				
1995	222	108	82	55	175	198	144	108	53	291	169	190
1996	298	125	90	67	237	240	174	129	46	277	221	133
1997	499	109	82	72	442	210	163	135	150	288	248	175
1998	305	111	85	52	245	219	169	108	81	349	261	171
1999	322	113	80	64	245	226	159	132	59	286	198	164
2000	313	72	47	45	245	135	84	86	58	180	94	139
2001	147	84	61	44	113	148	105	86	11	248	132	197
2002	200	82	60	43	146	133	93	75	5	102	91	41
2003	279	74	57	37	221	127	90	68	37	123	99	54
2004	277	77	52	45	233	142	92	89	47	210	162	102
2005	214	70	44	44	170	116	77	72	41	199	117	136
2006	191	65	37	46	140	116	69	79	32	201	101	151
Averages (1985-2006)	250	108	61	76	197	203	115	142	52	230	132	164

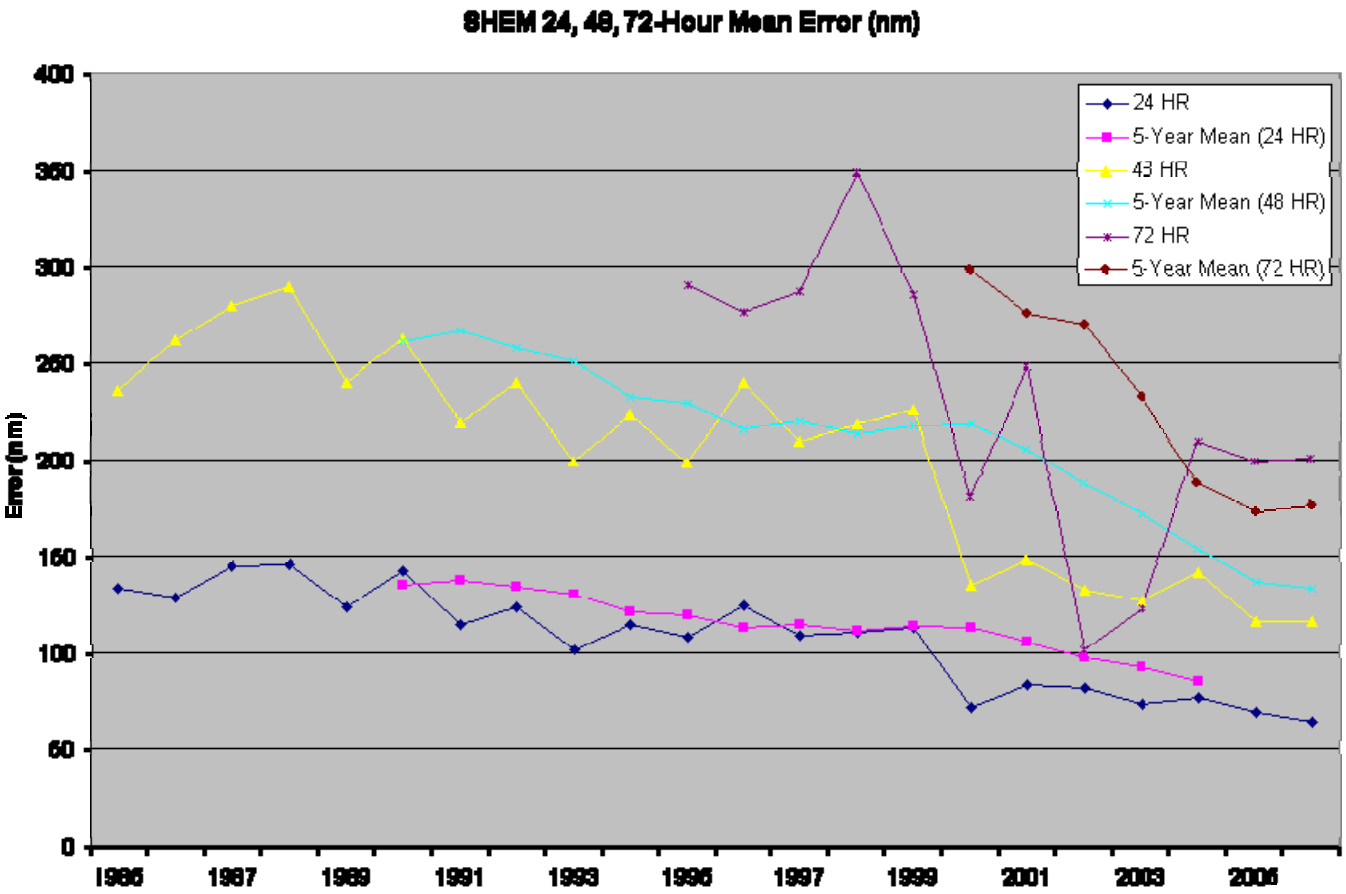


Figure 4-4. Mean track forecast error (nm) and 5-year running mean for 24, 48 and 72 hours for Southern Hemisphere Ocean Tropical Cyclones from 1985-2006.

4.2 TESTING AND RESULTS

A comparison of selected techniques is included in Table 4-4 for all Western North Pacific tropical cyclones, Table 4-5 for North Indian Ocean tropical cyclones, and Table 4-6 for Southern Hemisphere tropical cyclones. For example, in Table 4-4 for the homogeneous comparison of the 12-hour mean forecast error between JTWC and CONW, 554 cases were available. The average forecast error at 12 hours was 37 nm for CONW and 39 nm for JTWC. The difference of 2 nm is shown in the lower right. Due to computational round-off, differences are not always exact.

Table 4-4

Error Statistics for Selected Objective Techniques Western North Pacific Ocean

12-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		JGSI		JTYI		NGPI		TCLI		WBAI	
JTWC	555	39																								
	39	0																								
CONW	554	39	577	36																						
	37	-2	36	0																						

AFWI	259	40	261	38	261	51																				
	51	11	51	13	51	0																				
AVNI	451	37	470	34	221	48	481	42																		
	42	6	42	8	44	-4	42	0																		
COWI	266	35	266	32	209	47	239	41	266	43																
	43	8	43	11	44	-3	43	2	43	0																
EGRI	312	37	313	35	220	48	264	41	243	43	313	45														
	45	8	45	10	45	-3	43	2	42	-1	45	0														
ECMI	31	39	31	36	16	72	23	41	24	44	28	46	31	39												
	39	0	39	3	43	-29	36	-5	38	-6	33	-13	39	0												
GFNI	457	37	475	34	235	49	429	41	251	43	273	44	28	37	480	45										
	46	9	45	11	47	-2	44	3	42	-1	44	0	50	13	45	0										
JGSI	291	36	291	33	223	49	253	41	239	42	271	43	24	36	260	43	291	37								
	37	1	37	4	38	-11	36	-5	36	-6	37	-6	42	6	37	-6	37	0								
JTYI	306	36	306	34	105	42	262	40	113	45	126	47	22	32	271	44	112	39	306	38						
	38	2	38	4	40	-2	38	-2	38	-7	40	-7	44	12	39	-5	38	-1	38	0						
NGPI	509	38	530	35	251	50	466	42	262	43	293	44	30	38	474	45	279	37	291	38	536	41				
	42	4	42	7	44	-6	40	-2	38	-5	40	-4	41	3	40	-5	39	2	40	2	41	0				
TCLI	263	35	263	32	197	49	233	39	225	39	242	42	25	39	242	41	234	36	110	33	258	38	263	46		
	46	11	46	14	50	1	45	6	42	3	44	2	50	11	44	3	45	9	38	5	46	8	46	0		
WBAI	470	40	474	37	232	49	397	43	242	43	278	46	28	37	400	47	254	38	273	39	445	43	232	45	475	49
	48	8	49	12	52	3	49	6	46	3	46	0	41	4	48	1	46	8	46	7	49	6	44	-1	49	0

24-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		JGSI		JTYI		NGPI		TCLI		WBAI	
JTWC	512	62																								
	62	0																								
CONW	511	62	532	59																						
	59	-3	59	0																						
AFWI	239	63	240	59	240	88																				
	88	25	88	29	88	0																				
AVNI	408	61	425	56	200	86	436	69																		
	70	9	69	13	68	-18	69	0																		
COWI	244	56	244	51	192	82	215	65	244	76																
	76	20	76	25	75	-7	76	11	76	0																
EGRI	294	60	295	56	210	84	245	66	227	76	295	77														

	77	17	77	21	75	-9	75	9	73	-3	77	0														
ECMI	28	57	28	50	15	81	21	59	22	71	26	79	28	53												
	53	-4	53	3	55	-26	45	-14	50	-21	50	-29	53	0												
GFNI	417	60	434	56	216	84	390	68	232	76	257	75	25	50	439	75										
	77	17	76	20	76	-8	74	6	70	-6	75	0	83	33	75	0										
JGSI	269	58	269	54	207	84	230	66	223	74	256	75	21	47	242	70	269	61								
	61	3	61	7	62	-22	61	-5	60	-14	61	-14	63	16	61	-9	61	0								
JTYI	283	58	283	54	98	72	241	65	107	76	121	80	21	49	251	74	106	64	283	63						
	63	5	63	9	65	-7	64	-1	62	-14	65	-15	71	22	63	-11	62	-2	63	0						
NGPI	469	61	489	57	232	87	424	69	241	75	276	76	27	52	434	75	257	61	271	63	495	68				
	68	7	68	11	70	-17	66	-3	63	-12	67	-9	63	11	66	-9	65	4	65	2	68	0				
TCLI	240	56	240	52	182	83	211	65	207	70	227	74	22	54	221	70	216	59	101	54	236	62	240	78		
	78	22	78	26	83	0	77	12	71	1	75	1	81	27	76	6	74	15	71	17	78	16	78	0		
WBAI	439	64	443	60	218	86	365	70	223	75	263	78	25	50	368	78	236	61	256	62	416	70	212	78	444	85
	85	21	85	25	89	3	86	16	80	5	82	4	68	18	85	7	83	22	79	17	85	15	78	0	85	0

36-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		JGSI		JTYI		NGPI		TCLI		WBAI	
JTWC	459	84																								
	84	0																								
CONW	459	84	485	79																						
	79	-5	79	0																						
AFWI	212	83	216	79	216	130																				
	130	47	130	51	130	0																				
AVNI	371	83	393	75	182	129	404	97																		
	99	16	98	23	95	-34	97	0																		
COWI	223	75	224	70	174	123	199	93	224	112																
	112	37	112	42	111	-12	111	18	112	0																
EGRI	268	80	269	75	192	125	225	94	210	112	269	111														
	111	31	111	36	110	-15	109	15	107	-5	111	0														
ECMI	26	68	26	68	14	97	21	81	21	111	26	116	26	67												
	67	-1	67	-1	71	-26	63	-18	61	-50	67	-49	67	0												
GFNI	376	82	398	76	196	128	361	97	212	112	234	111	24	63	403	101										
	103	21	102	26	101	-27	100	3	92	-20	98	-13	105	42	101	0										

JGSI	248	79	248	74	189	125	214	93	207	109	235	111	21	65	223	93	248	85								
	85	6	85	11	87	-38	85	-8	82	-27	84	-27	85	20	84	-9	85	0								
JTYI	255	78	257	72	87	103	223	92	95	110	109	112	19	58	229	96	96	81	257	86						
	85	7	86	14	83	-20	88	-4	77	-33	80	-32	96	38	86	-10	78	-3	86	0						
NGPI	422	83	448	77	209	129	393	97	222	111	253	111	26	67	399	101	238	85	249	85	454	90				
	90	7	91	14	95	-34	87	-10	84	-27	88	-23	90	23	89	-12	86	1	86	1	90	0				
TCLI	216	77	218	71	164	123	193	94	190	107	209	110	21	70	202	94	200	83	91	72	216	85	218	104		
	104	27	104	33	112	-11	103	9	98	-9	100	-10	103	33	102	8	102	19	91	19	104	19	104	0		
WBAI	395	84	403	78	196	126	336	97	204	109	241	113	24	63	336	104	219	83	233	81	379	92	193	103	404	121
	120	36	120	42	125	-1	123	26	114	5	116	3	91	28	122	18	120	37	112	31	121	29	114	11	121	0

48-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		JGSI		JTYI		NGPI		TCLI		WBAI	
JTWC	408	104																								
	104	0																								
CONW	407	103	436	97																						
	98	-5	97	0																						
AFWI	189	100	193	96	193	172																				
	170	70	172	76	172	0																				
AVNI	317	100	342	91	158	168	353	123																		
	127	27	124	33	121	-47	123	0																		
COWI	199	93	201	87	155	164	173	121	201	153																
	154	61	153	66	154	-10	145	24	153	0																
EGRI	237	99	239	93	169	162	196	123	185	152	239	138														
	134	35	138	45	138	-24	133	10	133	-19	138	0														
ECMI	25	85	25	84	13	124	20	102	20	151	25	163	25	85												
	85	0	85	1	90	-34	78	-24	78	-73	85	-78	85	0												
GFNI	327	102	352	95	169	172	311	124	186	151	204	142	23	78	357	130										
	131	29	130	35	127	-45	124	0	116	-35	125	-17	126	48	130	0										
JGSI	218	95	219	90	167	160	184	119	183	148	203	139	19	79	196	118	219	107								
	107	12	107	17	108	-52	105	-14	102	-46	104	-35	105	26	107	-11	107	0								

JTYI	222	95	228	87	76	143	194	118	83	139	93	142	18	73	200	120	85	97	228	103						
	103	8	103	16	98	-45	106	-12	89	-50	95	-47	119	46	103	-17	91	-6	103	0						
NGPI	371	101	399	95	184	171	342	123	199	152	224	139	25	85	353	130	211	106	220	103	405	110				
	110	9	110	15	110	-61	104	-19	102	-50	107	-32	116	31	109	-21	104	-2	105	2	110	0				
TCLI	193	95	196	89	147	159	167	122	171	149	187	140	20	89	181	119	178	106	82	86	194	104	196	129		
	129	34	129	40	136	-23	127	5	124	-25	128	-12	125	36	127	8	127	21	106	20	129	25	129	0		
WBAI	350	104	361	95	175	162	291	121	182	146	212	140	23	78	295	130	193	101	208	100	335	110	173	126	363	160
	159	55	159	64	161	-1	158	37	150	4	153	13	116	38	162	32	156	55	148	48	158	48	154	28	160	0

72-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		JGSI		JTYI		NGPI		TCLI		WBAI	
JTWC	329	150																								
	150	0																								
CONW	329	150	351	140																						
	142	-8	140	0																						
AFWI	146	141	147	138	147	264																				
	262	121	264	126	264	0																				
AVNI	231	145	250	133	106	239	261	186																		
	196	51	190	57	182	-57	186	0																		
COWI	157	135	158	125	118	252	121	183	158	227																
	228	93	227	102	237	-15	212	29	227	0																
EGRI	176	142	176	131	119	240	127	184	136	231	176	178														
	178	36	178	47	168	-72	170	-14	174	-57	178	0														
ECMI	21	136	21	126	9	235	12	178	17	226	19	189	21	109												
	109	-27	109	-17	100	-135	67	-111	93	-133	115	-74	109	0												
GFNI	251	146	271	135	121	259	222	188	145	229	141	180	19	87	276	192										
	195	49	193	58	186	-73	185	-3	179	-50	174	-6	145	58	192	0										
JGSI	173	136	173	129	127	252	135	190	142	217	148	181	16	88	148	175	173	142								
	14	6	14	13	14	-	14	-49	13	-79	13	-45	13	48	14	-33	14	0								

	2		2		2	110	1		8		6		6		2		2									
JTYI	180	142	181	129	58	252	139	192	69	213	67	197	15	86	151	179	67	120	181	139						
	139	-3	139	10	130	-122	143	-49	112	-101	121	-76	125	39	132	-47	109	-11	139	0						
NGPI	293	148	314	136	137	257	250	186	154	226	164	180	21	109	268	189	163	140	172	137	320	156				
	157	9	156	20	150	-107	150	-36	140	-86	152	-28	157	48	150	-39	145	5	150	13	156	0				
TCLI	149	139	150	130	109	254	112	191	132	227	133	181	16	117	135	175	135	136	66	100	146	144	150	201		
	202	63	201	71	201	-53	201	10	194	-33	202	21	173	56	198	23	198	62	145	45	196	52	201	0		
WBAI	285	151	289	138	135	254	215	191	148	223	158	178	19	87	226	194	156	135	165	140	262	154	135	196	289	255
	256	105	255	117	249	-5	260	69	244	21	232	54	168	81	259	65	250	115	246	106	250	96	257	61	255	0

96-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AVNI		COWI		EGRI		ECMI		GFNI		JGSI		NGPI									
JTWC	229	215																								
	215	0																								
CONW	226	215	267	204																						
	208	-7	204	0																						
AVNI	166	216	188	197	199	268																				
	291	75	276	79	268	0																				
COWI	1	93	1	49	0	0	1	92																		
	92	-1	92	43	0	0	92	0																		
EGRI	111	205	123	192	87	262	1	92	123	208																
	211	6	208	16	208	-194	70	-22	208	0																
ECMI	14	217	16	245	12	268	0	0	12	180	16	111														
	120	-97	111	-134	74	-194	0	0	91	-89	111	0														
GFNI	179	219	201	205	164	273	1	92	96	208	15	99	206	249												
	254	35	250	45	245	-28	150	58	239	31	181	82	249	0												
JGSI	36	240	40	210	25	318	1	92	36	185	2	127	35	276	40	222										
	221	-19	222	12	241	-77	65	-27	215	30	125	-2	211	-65	222	0										

NGPI	215	216	243	202	190	271	1	92	114	211	16	111	200	246	36	217	250	209								
	211	-5	209	7	205	-66	95	3	198	-13	180	69	205	-41	210	-7	209	0								

120-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AVNI		COWI		EGRI		ECMI		GFNI		NGPI											
JTWC	160	302																								
	302	0																								
CONW	158	304	199	281																						
	292	-12	281	0																						
AVNI	116	306	140	285	151	378																				
	433	127	392	107	378	0																				
COWI	1	163	1	90	0	0	1	108																		
	108	-55	108	18	0	0	108	0																		
EGRI	77	284	89	267	59	378	1	108	89	285																
	283	-1	285	18	278	-100	134	26	285	0																
ECMI	12	326	12	360	9	363	0	0	9	317	12	170														
	170	-156	170	-190	132	-231	0	0	120	-197	170	0														
GFNI	126	307	149	287	123	380	1	108	67	268	11	157	154	342												
	344	37	342	55	341	-39	210	102	335	67	253	96	342	0												
NGPI	150	300	179	277	141	379	1	108	81	284	12	170	149	336	186	275										
	278	-22	276	-1	271	-108	116	8	258	-26	243	73	270	-66	275	0										

Table 4-5 Error Statistics for Selected Objective Techniques North Indian Ocean

12-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI	
JTWC	23	44																				
	44	0																				

CONW	23	44	43	44																		
	40	-4	44	0																		
AFWI	14	47	22	46	22	50																
	45	-2	50	4	50	0																
AVNI	13	42	23	40	18	50	23	34														
	34	-8	34	-6	39	-11	34	0														
COWI	2	43	2	30	2	29	1	13	2	30												
	30	-13	30	0	30	1	29	16	30	0												
EGRI	16	51	26	51	18	54	16	42	1	31	26	59										
	50	-1	59	8	50	-4	48	6	18	-13	59	0										
ECMI	2	67	4	70	3	75	2	80	1	31	4	73	4	59								
	43	-24	59	-11	56	-19	72	-8	25	-6	59	-14	59	0								
GFNI	13	46	24	40	18	51	20	35	2	30	16	52	3	56	24	48						
	48	2	48	8	49	-2	47	12	45	15	53	1	65	9	48	0						
NGPI	14	46	26	41	19	49	22	35	2	30	18	49	3	56	23	49	26	52				
	52	6	52	11	55	6	50	15	36	6	62	13	90	34	52	3	52	0				
TCLI	7	56	12	46	12	51	12	38	0	0	12	50	1	60	12	52	12	60	12	55		
	58	2	55	9	55	4	55	17	0	0	55	5	109	49	55	3	55	-5	55	0		
WBAI	18	46	35	47	18	54	18	36	1	29	22	66	3	70	20	52	21	57	12	55	35	69
	67	21	69	22	72	18	72	36	82	53	77	11	96	26	65	13	70	13	71	16	69	0

24-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI	
JTWC	19	64																				
	64	0																				
CONW	19	64	35	58																		
	56	-8	58	0																		
AFWI	12	64	19	59	19	77																
	72	8	77	18	77	0																
AVNI	11	60	20	52	15	82	20	42														
	43	-17	42	-10	46	-36	42	0														
COWI	2	50	2	36	2	31	1	11	2	45												
	45	-5	45	9	45	14	46	35	45	0												
EGRI	13	74	21	69	15	87	13	51	1	43	21	79										
	69	-5	79	10	71	-16	70	19	38	-5	79	0										
ECMI	2	74	4	75	3	81	2	63	1	43	4	86	4	51								
	31	-43	51	-24	40	-41	45	-18	30	-13	51	-35	51	0								
GFNI	10	68	20	51	14	84	16	45	1	43	13	79	3	40	20	62						
	62	-6	62	11	63	-21	67	22	51	8	67	-12	51	11	62	0						
NGPI	12	63	23	50	16	78	19	41	2	45	15	71	3	40	19	66	23	70				
	66	3	70	20	75	-3	69	28	53	8	83	12	83	43	74	8	70	0				
TCLI	6	78	10	65	10	92	10	50	0	0	10	75	1	32	10	71	10	87	10	91		
	102	24	91	26	91	-1	91	41	0	0	91	16	159	127	91	20	91	4	91	0		
WBAI	15	66	28	62	16	85	16	46	1	46	18	86	3	57	17	64	19	76	10	91	28	118
	114	48	118	56	125	40	128	82	126	80	131	45	108	51	109	45	119	43	130	39	118	0

36-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI	
JTWC	15	81																				
	81	0																				
CONW	15	81	28	80																		
	78	-3	80	0																		
AFWI	9	75	14	82	14	124																
	113	38	124	42	124	0																
AVNI	9	70	16	74	12	130	16	57														
	66	-4	57	-17	62	-68	57	0														
COWI	2	49	2	41	2	56	1	38	2	61												
	61	12	61	20	61	5	72	34	61	0												
EGRI	11	90	18	92	12	129	10	70	1	49	18	102										
	84	-6	102	10	98	-31	97	27	51	2	102	0										
ECMI	2	55	4	77	3	116	2	93	1	49	4	124	4	48								
	25	-30	48	-29	49	-67	70	-23	8	-41	48	-76	48	0								
GFNI	7	83	15	74	11	131	13	59	1	49	11	100	3	49	15	82						
	81	-2	82	8	85	-46	87	28	62	13	80	-20	62	13	82	0						
NGPI	9	73	18	70	13	122	15	57	2	61	12	96	3	49	15	82	18	93				
	92	19	93	23	104	-18	98	41	65	4	110	14	87	38	99	17	93	0				
TCLI	5	90	8	91	8	142	8	66	0	0	8	88	1	42	8	90	8	121	8	126		
	134	44	126	35	126	-16	126	60	0	0	126	38	176	134	126	36	126	5	126	0		
WBAI	12	85	23	84	12	134	14	61	1	72	16	107	3	61	13	82	16	97	8	126	23	185
	188	103	185	101	206	72	206	145	180	108	198	91	124	63	194	112	197	100	219	93	185	0

48-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		COWI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI	
JTWC	13	92																				
	92	0																				
CONW	13	92	23	102																		
	97	5	102	0																		
AFWI	7	92	11	118	11	191																
	175	83	191	73	191	0																
AVNI	8	75	14	95	10	191	14	82														
	85	10	82	-13	89	-102	82	0														
COWI	1	51	1	76	1	130	1	66	1	132												
	132	81	132	56	132	2	132	66	132	0												
EGRI	9	100	14	126	9	205	8	100	0	0	14	142										
	115	15	142	16	153	-52	140	40	0	0	142	0										
ECMI	1	42	3	142	2	215	2	115	0	0	3	238	3	102								
	67	25	102	-40	110	-105	110	-5	0	0	102	-136	102	0								

GFNI	5	91	11	105	8	215	11	87	0	0	7	152	2	110	11	103						
	88	-3	103	-2	99	-116	103	16	0	0	103	-49	86	-24	103	0						
NGPI	7	79	13	97	10	191	13	84	1	132	8	140	2	110	11	103	13	116				
	102	23	116	19	130	-61	116	32	49	-83	150	10	105	-5	125	22	116	0				
TCLI	4	99	6	127	6	226	6	97	0	0	6	122	1	67	6	104	6	158	6	157		
	159	60	157	30	157	-69	157	60	0	0	157	35	186	119	157	53	157	-1	157	0		
WBAI	11	101	19	110	10	198	12	90	1	132	13	148	3	102	10	106	12	122	6	157	19	239
	234	133	239	129	263	65	264	174	257	125	252	104	183	81	254	148	264	142	268	111	239	0

72-HOUR MEAN FORECAST ERROR (NM)

	CONW		AFWI		AVNI		EGRI		GFNI		NGPI		TCLI		WBAI							
CONW	15	177																				
	177	0																				
AFWI	6	169	6	210																		
	210	41	210	0																		
AVNI	8	131	5	190	8	140																
	140	9	138	-52	140	0																
EGRI	9	225	5	219	4	150	9	313														
	313	88	321	102	272	122	313	0														
GFNI	3	173	3	248	3	163	3	359	3	100												
	100	-73	100	-148	100	-63	100	-259	100	0												
NGPI	7	142	5	190	7	145	4	272	3	100	7	113										
	113	-29	130	-60	113	-32	148	-124	163	63	113	0										
TCLI	2	121	2	203	2	152	2	226	2	94	2	156	2	201								
	201	80	201	-2	201	49	201	-25	201	107	201	45	201	0								
WBAI	12	206	5	219	6	154	9	313	3	100	6	122	2	201	12	378						
	378	172	337	118	405	251	359	46	270	170	405	283	273	72	378	0						

96-HOUR MEAN FORECAST ERROR (NM)

	CONW		AVNI		EGRI																	
CONW	5	223																				
	223	0																				
AVNI	1	34	1	117																		
	117	83	117	0																		
EGRI	3	338	0	0	4	495																
	559	221	0	0	495	0																

Table 4-6 Error Statistics for Selected Objective Techniques Southern Hemisphere

12-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI									
JTWC	219	40																										
	40	0																										
CONW	218	40	392	44																								
	39	-1	44	0																								
AFWI	144	39	213	38	213	52																						
	52	13	52	14	52	0																						
AVNI	171	37	255	38	195	52	255	40																				
	40	3	40	2	41	-11	40	0																				
EGRI	189	39	294	43	188	51	222	39	294	53																		
	46	7	53	10	48	-3	48	9	53	0																		
ECMI	3	40	6	50	3	55	6	46	4	44	6	56																
	36	-4	56	6	55	0	56	10	46	2	56	0																
GFNI	196	39	324	41	209	52	249	40	254	50	5	53	324	45														
	42	3	45	4	42	-10	41	1	43	-7	58	5	45	0														
NGPI	195	39	323	40	212	52	251	40	251	49	6	56	302	43	323	48												
	46	7	48	8	45	-7	43	3	46	-3	67	11	48	5	48	0												
TCLI	134	38	187	37	130	49	169	39	169	50	4	46	171	41	173	42	187	53										
	53	15	53	16	55	6	53	14	54	4	86	40	53	12	54	12	53	0										
WBAI	211	40	375	43	210	52	244	41	280	50	5	63	314	45	313	49	176	52	376	54								
	52	12	54	11	54	2	54	13	55	5	78	15	53	8	53	4	55	3	54	0								

24-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI									
JTWC	191	65																										
	65	0																										
CONW	190	65	354	69																								
	63	-2	69	0																								
AFWI	127	66	193	63	193	84																						
	82	16	84	21	84	0																						
AVNI	145	62	224	62	176	83	224	67																				
	68	6	67	5	67	-16	67	0																				
EGRI	166	63	266	68	173	82	198	66	266	86																		
	77	14	86	18	82	0	83	17	86	0																		
ECMI	2	47	5	60	3	57	5	63	3	51	5	68																
	63	16	68	8	60	3	68	5	60	9	68	0																
GFNI	169	65	289	65	188	84	219	68	230	83	4	67	289	76														
	75	10	76	11	76	-8	74	6	74	-9	99	32	76	0														
NGPI	168	64	289	62	192	84	221	68	227	82	5	68	268	74	289	82												
	77	13	82	20	79	-5	75	7	78	-4	98	30	82	8	82	0												
TCLI	114	64	166	62	120	84	151	70	150	83	3	60	154	77	155	75	166	94										

	92	28	94	32	100	16	96	26	94	11	138	78	96	19	95	20	94	0										
WBAI	186	65	341	66	190	83	217	67	255	82	5	68	282	77	282	82	159	93	342	95								
	92	27	95	29	101	18	101	34	100	18	117	49	98	21	95	13	105	12	95	0								

36-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI									
JTWC	163	90																										
	90	0																										
CONW	163	90	318	90																								
	84	-6	90	0																								
AFWI	106	92	170	87	170	109																						
	108	16	109	22	109	0																						
AVNI	122	89	194	86	152	108	194	90																				
	96	7	90	4	92	-16	90	0																				
EGRI	144	86	240	91	154	105	178	90	240	119																		
	115	29	119	28	117	12	121	31	119	0																		
ECMI	1	79	3	98	2	113	3	62	2	79	3	98																
	131	52	98	0	100	-13	98	36	100	21	98	0																
GFNI	145	91	259	86	165	108	190	91	207	116	3	98	259	110														
	110	19	110	24	114	6	109	18	108	-8	150	52	110	0														
NGPI	143	90	257	84	169	109	191	91	205	118	3	98	239	108	257	117												
	113	23	117	33	115	6	109	18	114	-4	152	54	116	8	117	0												
TCLI	97	92	146	86	105	119	133	95	134	120	2	100	134	113	136	110	146	137										
	133	41	137	51	148	29	142	47	136	16	224	124	140	27	141	31	137	0										
WBAI	159	89	305	87	167	108	187	91	229	114	3	98	252	110	250	117	139	135	306	139								
	133	44	139	52	155	47	158	67	152	38	203	105	145	35	143	26	163	28	139	0								

48-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		EGRI		ECMI		GFNI		NGPI		TCLI		WBAI									
JTWC	140	116																										
	116	0																										
CONW	140	116	286	114																								
	110	-6	114	0																								
AFWI	90	120	149	114	149	141																						
	143	23	141	27	141	0																						
AVNI	99	118	161	113	127	142	161	115																				
	124	6	115	2	117	-25	115	0																				
EGRI	123	112	209	117	134	142	149	116	209	156																		
	154	42	156	39	162	20	165	49	156	0																		
ECMI	1	153	1	111	1	192	1	137	1	97	1	174																
	174	21	174	63	174	-18	174	37	174	77	174	0																
GFNI	121	116	225	111	143	139	157	115	179	155	1	174	225	145														
	146	30	145	34	153	14	145	30	145	-10	159	-15	145	0														
NGPI	120	116	226	110	148	141	158	116	177	156	1	174	205	141	226	155												

	151	35	155	45	155	14	141	25	151	-5	58	-116	153	12	155	0												
TCLI	85	122	129	115	92	159	115	125	119	171	1	174	116	148	119	144	129	190										
	190	68	190	75	208	49	200	75	193	22	223	49	196	48	197	53	190	0										
WBAI	136	115	274	111	146	140	154	115	199	152	1	174	218	145	219	156	122	189	275	189								
	183	68	188	77	216	76	222	107	206	54	54	-120	197	52	194	38	226	37	189	0								

72-HOUR MEAN FORECAST ERROR (NM)

	JTWC		CONW		AFWI		AVNI		EGRI		GFNI		NGPI		TCLI		WBAI											
JTWC	32	201																										
	201	0																										
CONW	32	201	225	166																								
	172	-29	166	0																								
AFWI	25	209	110	165	110	216																						
	261	52	216	51	216	0																						
AVNI	19	204	103	156	77	212	103	164																				
	275	71	164	8	159	-53	164	0																				
EGRI	31	204	148	169	93	218	92	169	148	242																		
	340	136	242	73	244	26	243	74	242	0																		
GFNI	27	194	159	158	96	201	96	160	122	240	159	204																
	199	5	204	46	217	16	204	44	209	-31	204	0																
NGPI	29	207	168	156	104	211	99	165	120	239	138	201	168	232														
	228	21	232	76	235	24	198	33	222	-17	218	17	232	0														
TCLI	17	220	88	162	61	237	74	178	81	256	76	206	82	205	88	284												
	368	148	284	122	307	70	291	113	291	35	276	70	292	87	284	0												
WBAI	31	192	215	165	107	210	96	163	139	240	152	206	161	235	81	283	217	312										
	221	29	312	147	366	156	376	213	334	94	318	112	329	94	408	125	312	0										

96-HOUR MEAN FORECAST ERROR (NM)

	CONW		AVNI		EGRI		GFNI		NGPI																			
CONW	141	224																										
	224	0																										
AVNI	64	173	64	200																								
	200	27	200	0																								
EGRI	94	219	55	187	95	281																						
	282	63	265	78	281	0																						
GFNI	101	206	56	204	73	272	103	268																				
	262	56	253	49	280	8	268	0																				
NGPI	110	210	61	197	74	268	87	259	113	350																		
	330	120	257	60	307	39	308	49	350	0																		

120-HOUR MEAN FORECAST ERROR (NM)

	CONW		AVNI		EGRI		GFNI		NGPI																			
CONW	91	276																										
	276	0																										
AVNI	43	188	43	192																								
	192	4	192	0																								
EGRI	51	264	31	182	51	281																						
	281	17	227	45	281	0																						
GFNI	59	241	30	190	38	274	61	336																				
	329	88	332	142	373	99	336	0																				
NGPI	67	251	41	190	38	253	47	326	68	496																		
	464	213	338	148	437	184	431	105	496	0																		