Chapter 4
South Pacific And South Indian Ocean Tropical Cyclones

4.1 GENERAL

In accordance with CINCPACINST 3140.1W, Southern Hemisphere tropical cyclones are numbered sequentially from 1 July through 30 June to encompass the period when the majority of the Southern Hemisphere tropical cyclones have occurred.

JTWC's Southern Hemisphere Area of Responsibility extends from 180 longitude, westward to the coast of Africa. For warning message delineation, JTWC's Southern Hemisphere AOR is subdivided 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.

The Operations Department of NAVPACMETOCCEN, Pearl Harbor, Hawaii issues warnings for South Pacific Ocean tropical cyclones east of 180 longitude.

4.2 SUMMARY

The total number of significant tropical cyclones during the 1998 season (Table 4-1) was 37 which was approximately 9 more than the climatological mean of 28.4 (Table 4-2).

A comparison of the 1998 tropical cyclone activity for the 3 Southern Hemisphere sub-basins against climatology. (Table 4-3 indicates that tropical cyclone activity was "normal" for the southern Indian Ocean and Australian basins, and nearly 3 times more active in the South Pacific.)

Composites of the tropical cyclone best tracks for the Southern Indian Ocean appear in Figures 4-1a, 4-1b, 4-2a, 4-2b, 4-3a, 4-3b and 4-3c.

Table 4-1 SOUTHERN HEMISPHERE TROPICAL CYCLONES FOR 1998 01 JULY 1997 - 30 JUNE 1998

TC	NAME	PERIOD	NUMBER ISSUED	EST MAX SFC WINDS KTS (M/SEC)	MSLP (MB)
01S	-	20 JUL 24 JUL	13	45 (23)	991
02P	LUSI	10 OCT 12 OCT	7	55 (28)	984
03P	-	26 OCT 29 OCT	4	35 (18)	997
*04P	MARTIN	30 OCT 04 NOV	(11)	100 (51)	944
05P	NUTE	18 NOV 20 NOV	6	70 (36)	972
*06P	OSEA	23 NOV 28 NOV	(8)	90 (46)	954
*07P	PAM	05 DEC 09 DEC	(8)	65 (33)	976
08S	SID	26 DEC 28 DEC	6	40 (21)	994
09S	SELWYN	27 DEC 01 JAN	11	65 (33)	976
*10P	RON	02 JAN 08 JAN	(14)	145 (75)	892
11P	SUSAN	03 JAN 10 JAN	13	140 (72)	898
12P	KATRINA	03 JAN 25 JAN	44	90 (46)	954
13S	-	18 JAN 22 JAN	11	35 (18)	997
14P	LES	24 JAN 01 FEB	22	50 (25)	987
15S	TIFFANY	24 JAN 31 JAN	19	120 (62)	922
*16P	TUI	25 JAN 26 JAN	(3)	40 (21)	994
*17P	URSULA	01 FEB 02 FEB	(2)	65 (33)	976
*18P	VELI	01 FEB 03 FEB	(4)	75 (39)	967
*19P	WES	01 FEB 04 FEB	(7)	45 (23)	991
20S	ANACELLE	08 FEB 13 FEB	16	115 (59)	927
21S	-	09 FEB 09 FEB	2	35 (18)	997
22S	VICTOR	10 FEB 18 FEB	24	90 (46)	954
23S	BELTANE	16 FEB 18 FEB	6	40 (21)	994
24S	-	16 FEB 18 FEB	5	45 (23)	991
25P	MAY	25 FEB 26 FEB	2	35 (18)	997
26S	DONALINE	06 MAR 09 MAR	6	55 (28)	984
27S	ELSIE	12 MAR 17 MAR	11	90 (46)	954
28S	FIONA	17 MAR 20 MAR	8	35 (18)	997
29P	YALI	18 MAR 27 MAR	24	90 (46)	954
30P	NATHAN	21 MAR 31 MAR	34	65 (33)	976
31P	ZUMAN	30 MAR 05 APR	15	100 (51)	944
32S	GEMMA	07 APR 15 APR	19	70 (36)	972
33S	-	07 APR 07 APR	2	30 (15)	1000
34S	-	19 APR 22 APR	10	40 (21)	994
35S	-	19 APR 19 APR	2	40 (21)	994
*36P	ALAN	22 APR 26 APR	(8)	45 (23)	991
*37P	BART	30 APR 01 MAY	(2)	35 (18)	997
		JTWC TOTAL	342		
		( ) NPMOC TOTAL	(67)		
		GRAND TOTAL	409		

*WARNINGS ISSUED BY NPMOC

Table 4-2 MONTHLY DISTRIBUTION OF SOUTH PACIFIC AND SOUTH INDIAN OCEAN TROPICAL CYCLONES 1981-1998

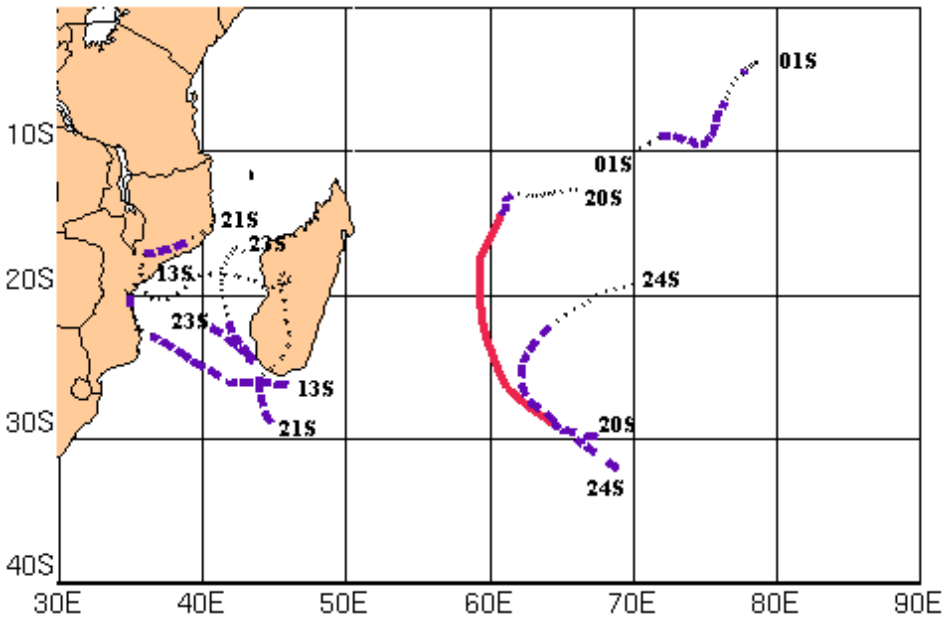
YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1958-1977 AVE*	-	-	-	0.4	1.5	3.6	6.1	5.8	4.7	2.1	0.5	-	24.7
1981	0	0	0	1	3	2	6	5	3	3	1	0	24
1982	1	0	0	1	1	3	9	4	2	3	1	0	25
1983	1	0	0	1	1	3	5	6	3	5	0	0	25
1984	1	0	0	1	2	5	5	10	4	2	0	0	30
1985	0	0	0	0	1	7	9	9	6	3	0	0	35
1986	0	0	1	0	1	1	9	9	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
TOTAL	7	2	6	13	28	61	2	122	85	55	189	3	512
AVERAGE (1981-1998)	0.4	0.1	0.4	0.7	1.6	3.4	6.2	6.8	4.7	3.0	1.1	0.2	28.4

* (Gray, 1978)

Table 4-3 ANNUAL VARIATION OF SOUTHERN HEMISPHERE TROPICAL CYCLONES BY OCEAN BASIN

YEAR	SOUTH INDIAN (WEST OF 105E)	AUSTRALIAN (105E - 165E)	SOUTH PACIFIC (EAST OF 165E)	TOTAL
1958-1977 AVE*	8.4	10.3	5.9	24.6
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
TOTAL	228	172	102	512
AVERAGE (1981-1998)	12.7	9.6	5.7	28.4

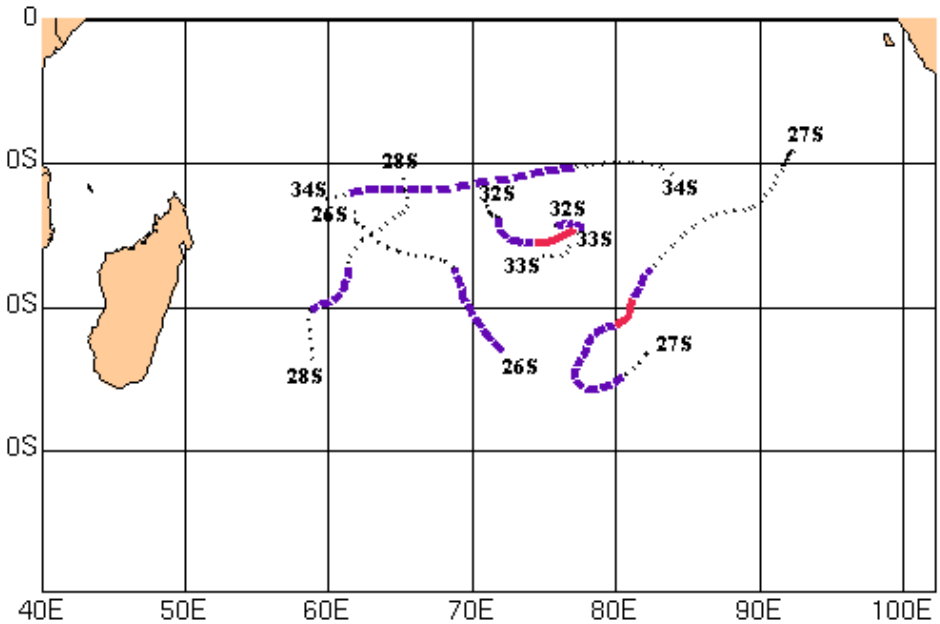
* (Gray,1978)



SOUTH INDIAN OCEAN
TROPICAL CYCLONES
20 JUL 97 - 16 FEB 98

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

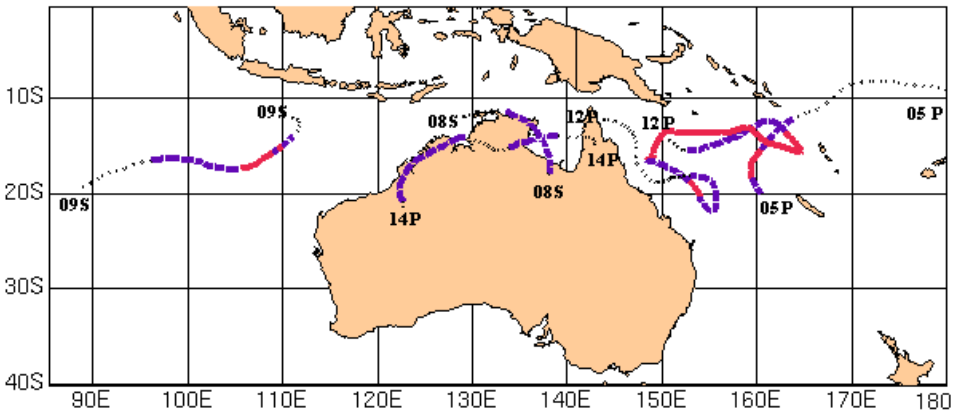
TC 01	20 JUL - 24 JUL
TC 13	18 JAN - 22 JAN
TC 20	08 FEB - 13 FEB
TC 21	09 FEB
TC 23	16 FEB - 18 FEB
TC 24	16 FEB - 18 FEB



SOUTH INDIAN OCEAN
TROPICAL CYCLONES
6 MAR 98 - 19 APR 98

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

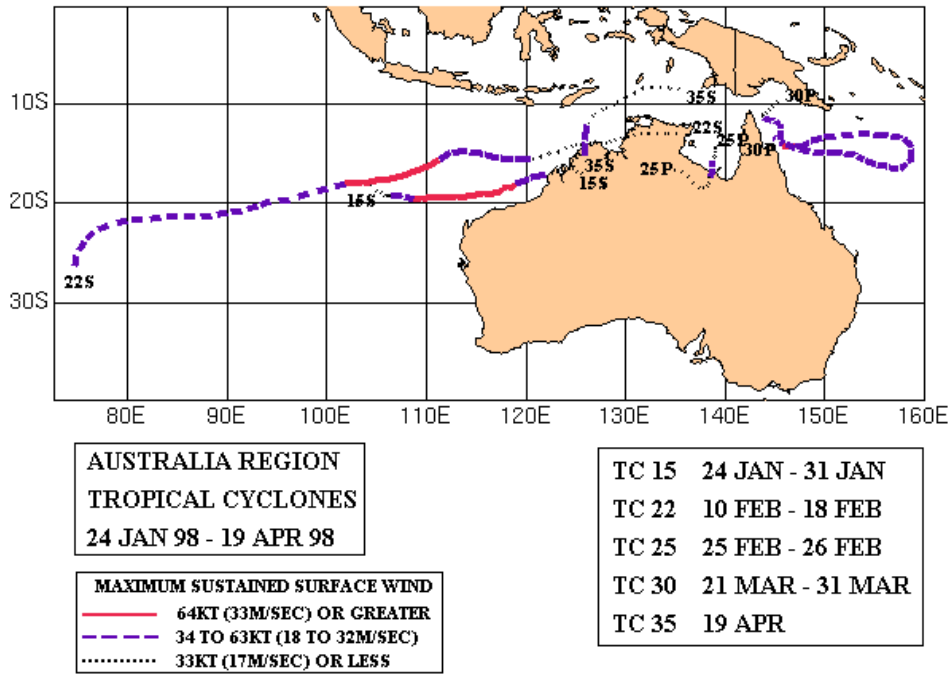
TC 26	06 MAR - 09 MAR
TC 27	12 MAR - 17 MAR
TC 28	17 MAR - 20 MAR
TC 32	07 APR - 15 APR
TC 33	07 APR
TC 34	19 APR - 22 APR

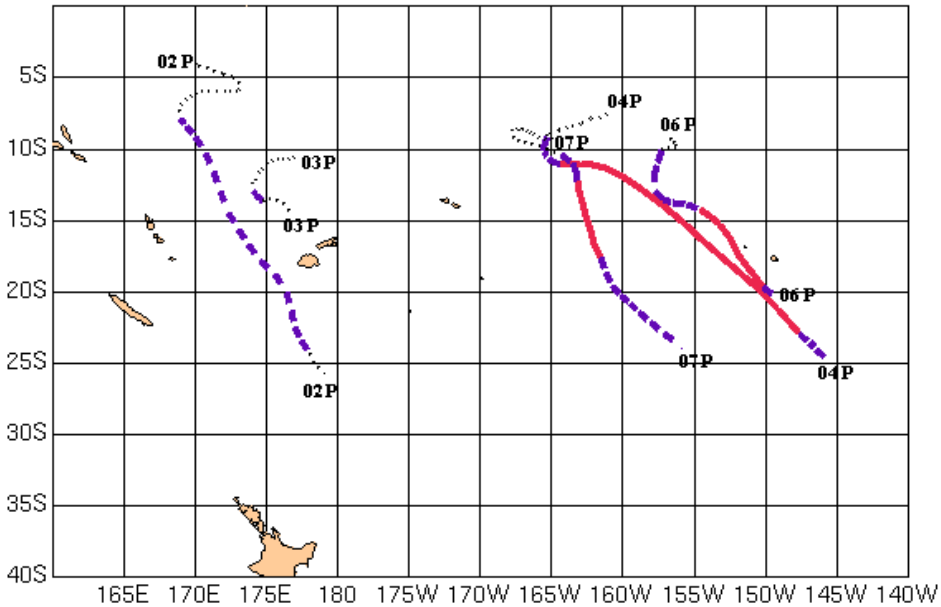


AUSTRALIA REGION
TROPICAL CYCLONES
18 NOV 97 - 24 JAN 98

TC 05	18 NOV - 20 NOV
TC 08	26 DEC - 28 DEC
TC 09	27 DEC - 01 JAN
TC 12	03 JAN - 25 JAN
TC 14	24 JAN - 01 FEB

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

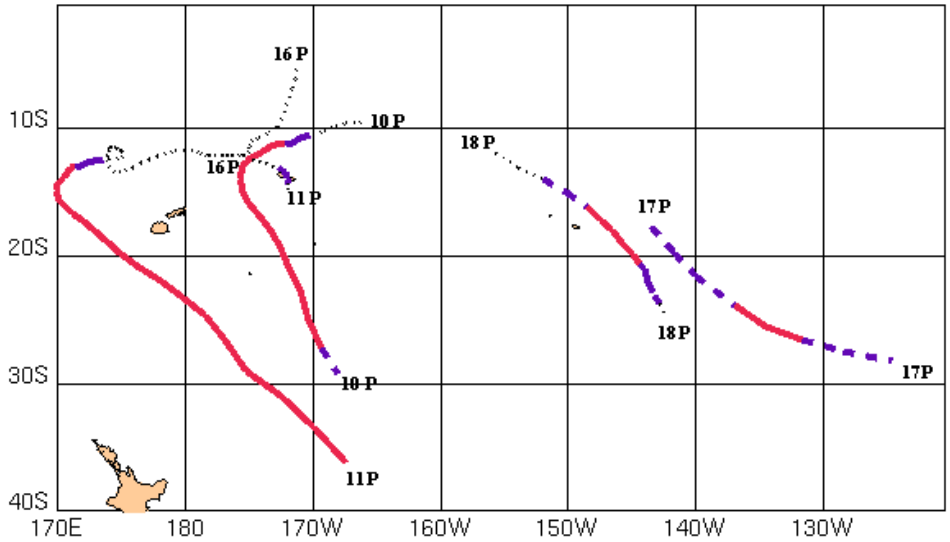

10S
20S
30S
80E
90E
100E
110E
120E
130E
140E
150E
160E
35S
30P
22S
25P
30P
35S
15S
25P
15S
22S
AUSTRALIA REGION
TROPICAL CYCLONES
24 JAN 98 - 19 APR 98
MAXIMUM SUSTAINED SURFACE WIND
64KT (33M/SEC) OR GREATER
34 TO 63KT (18 TO 32M/SEC)
33KT (17M/SEC) OR LESS
TC 15 24 JAN - 31 JAN
TC 22 10 FEB - 18 FEB
TC 25 25 FEB - 26 FEB
TC 30 21 MAR - 31 MAR
TC 35 19 APR



SOUTH PACIFIC OCEAN
TROPICAL CYCLONES
08 OCT 97 - 05 DEC 97

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

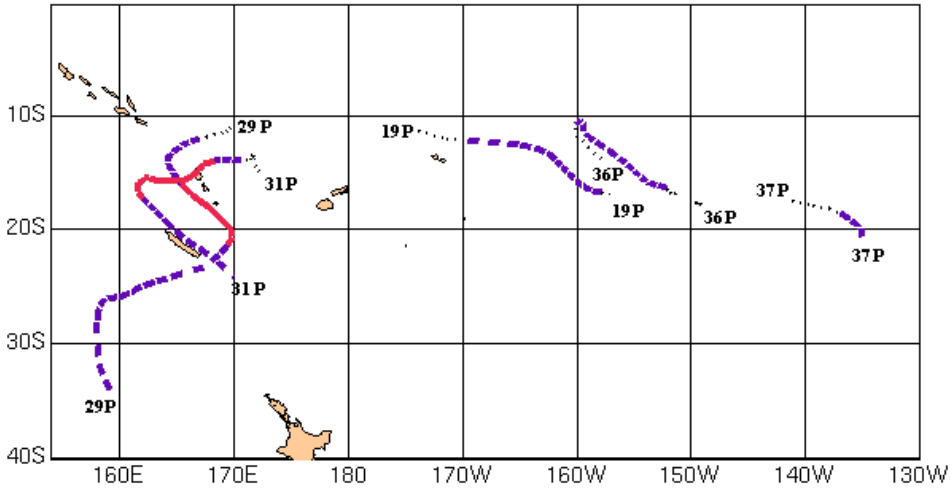
TC 02	08 OCT - 12 OCT
TC 03	26 OCT - 28 OCT
TC 04	30 OCT - 04 NOV
TC 06	23 NOV 0 26 NOV
TC 07	05 DEC - 09 DEC



SOUTH PACIFIC OCEAN
TROPICAL CYCLONES
02 JAN 98 - 01 FEB 98

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

TC 10	02 JAN - 08 JAN
TC 11	03 JAN - 08 JAN
TC 16	25 JAN - 26 JAN
TC 17	01 FEB
TC 18	01 FEB - 03 FEB



SOUTH PACIFIC OCEAN
TROPICAL CYCLONES
01 FEB 98 - 30 APR 98

TC 19	01 FEB - 04 FEB
TC 29	18 MAR - 27 MAR
TC 31	30 MAR - 05 APR
TC 36	22 APR - 26 APR
TC 37	30 APR - 01 MAY

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