

TROPICAL DEPRESSIONS IN THE NORTH WESTERN
AUSTRALIAN REGION DURING THE 1957-1958 SEASON

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Abstract: In the 1957-1958 season there were six tropical depressions detected in the North Western Australian region. These systems were classified into three types and catalogued. A case study was made of each depression and their main features documented.

1. THE 1957-1958 CYCLONE SEASON

The first centre, located off the north-west coast of Western Australia on the 16th December 1957, did not develop and filled on the 19th December. There were no further developments until the 15th January 1958 when a centre developed in the Timor Sea, moved in a parabolic path, crossed the coastline between Onslow and Roebourne, and finally dissipated near Wiluna on the 22nd January.

In February, there were two cyclones which only affected ocean areas. The first passed the Cocos Island area during the period, 8th to 16th, moving generally in a south-west direction. The second system affected the north-east Indian Ocean area south of Christmas Island during the period, 13th to 16th. From the scanty information available neither centre appeared to be intense.

In March, two intense cyclones developed off the north-west coast and passed inland near Onslow. These centres were both important from the viewpoint of pastoral rain and property damage. Their occurrence within about ten days of each other and their similar tracks were rather unusual.

2. CLASSIFICATION

The following standard classification was adopted based on wind force while the centre was north of latitude 28°S.

- Type A: Tropical depressions with reported or estimated winds less than 34 knots.
- Type B: Tropical depressions with wind speeds greater than 34 knots, but with gale force winds not extending more than 100 miles from the centre.
- Type C: Tropical depressions with wind speeds greater than 34 knots and with gale force winds extending more than 100 miles from the centre.

Using this system of classification the 1957-1958 depressions were listed thus:-

Identification List

Tropical Depressions, 1957-1958 Season

No.	Type	Date	Region
1	A	16th-19th December 1957.	Off north-west coast of W.A.
2	C	15th-22nd January 1958.	North-west coast of W.A.
3	C	8th-16th February 1958.	Cocos Island southwards to Indian Ocean.
4	C	13th-16th February 1958.	North-east Indian Ocean.
5	C	1st-5th March 1958.	North-west coast of W.A. - Onslow.
6	C	14th-16th March 1958.	North-west coast of W.A. - Onslow.

Tracks were drawn for each depression and points on the track were denoted using the code form PPYYGG (see Figs. 1 to 3). For purposes of catalogue identification, the code form NNTY_y_y YYY Y M (QL L L L) was adopted. The code symbols have
 1 1 2 2 o a a o o
 the following interpretation:-

- PP - Central pressure in tens and units of millibars.
- YY - Date, Greenwich.
- GG - Greenwich mean time.
- NN - Sequence number of the depression.
- T - Type of depression (A, B or C).
- $Y_y Y_y$ - Year in tens and units.
- $Y_1 Y_1$ - Greenwich date of first location.
- $Y_2 Y_2$ - Greenwich date of last location.
- M_o - Month of $Y_2 Y_2$ (January to October, 1 to 0; November and December, 1 and 2 with 50 added to $Y_2 Y_2$).
- $QL_a L_a L_o L_o$ - Octant of Globe (7); latitude and longitude in degrees, tens and units.

Using these code symbols the depressions for 1957-1958 are catalogued as follows:-

Catalogue Identification - 1957-1958

01A57 16692 (71619 71818 71917)

02C58 15221 (71522 71620 71718 71916 72217 72620)

03C58 08162 (70801 71099 71195 71393 71594 71890)

04C58 13162 (71407 71606 71808)

05C58 01053 (71618 71914 72214 72518)

06C58 14163 (71915 72114 72215 72317 72522)

3. DOCUMENTATION AND CONCLUSIONS

An historical review was made of the season and the type C depressions were described under the headings of development, track, rainfall, winds and seas, and damage. The minor type A centre, being insignificant, was not discussed further. The case studies are included in the Appendix.

Generally the available data was scarce, particularly for the February cyclones, which were confined to ocean areas. However it was possible to plot the movements of the centres with reasonable accuracy and to issue adequate warning advices. Mature cyclones affecting the north-west coast average two or three per season. Thus with regard to seasonal frequency, the 1957-1958 season was about normal. The actual monthly frequency is highly variable from year to year, but on the average is approximately equal for January, February and March. Hence from the viewpoint of monthly frequency, the occurrence of two cyclones in the first part of March was a notable deviation from the normal.

A survey of the season emphasized the necessity for issuing preliminary advice when the synoptic situation indicates the existence of suspicious conditions. This initial advisory information enables commercial and other interests to make the necessary preparations for weathering a storm.

APPENDIX

Depression 2C, Type C, 15th-22nd January 1958

02058 15221 (71522 71620 71718 71916 72217 72620)

Development:

This centre was located in the Timor Sea area and its central pressure at the time of first location was 1006 mb. The centre deepened gradually to 1002 mb on January 19th and a disturbance warning was issued at 0900Z on this day. The warning advice was changed to a cyclone warning at 1700Z on January 20th when the central pressure had fallen to 996 mb. After this the centre showed indications of weakening and the final warning was issued at 2330Z on this day.

Track:

The centre moved in a parabolic path crossing the coastline between Onslow and Roebourne in the vicinity of Mardie Station. Moving inland in a south-east direction, the centre reached the vicinity of Wiluna on January 22nd where it finally filled. The speed of the cyclone over the ocean was of the order of 5 knots, but its speed increased to about 15 knots after it had crossed the coast.

Rainfall:

Heavy rain was recorded in the West Kimberley during the early stages of development, the highest recording being 548 points at Cockatoo Island during the 24 hours ending 0100Z on January 17th. Heavy rain was received in the De Grey and Fortescue divisions as the cyclone crossed the coast. High 24 hour falls were 773 points at Mardie Station and 689 points at Roebourne.

Winds and Seas:

The highest winds reported were of the order of 30 to 35 knots, although the pressure gradient indicated that winds of slightly higher velocity probably existed. Seas were generally moderate to rough at the time of greatest intensity, but lack of information prevented the determination of the state of the sea over ocean areas.

Damage:

No reports of damage were received.

Depression 3C, Type C, 8th-16th February 1958

03C58 08162 (70801 71099 71195 71393 71594 71890)

Development:

There were indications of development over the ocean area about 300 miles NE of Cocos on February 8th, when a centre of pressure 1005 mb became evident, mainly from the sequence of reports at Cocos. The centre showed little change in intensity for several days, but then began to deepen on February 13th south-south-west of Cocos. The pressure at this stage was 998 mb. Little change was evident after this, and the centre possibly commenced filling about February 16th.

Track:

Initially the centre moved west-south-west and by 0100Z on February 11th it was located about 200 miles west-north-west of Cocos. At this stage a change in direction of movement occurred. The track curved to the SE and the centre reached a point about 250 miles south-south-west of Cocos at 0100Z on February 13th. Recurving to the west-south-west then took place and by 0100Z on February 15th, the centre had moved beyond longitude 90°E. The subsequent history of this cyclone was uncertain due to lack of information over the ocean areas.

Rainfall:

Cocos was the only regular reporting station providing rainfall information. Rainfall was received at this station on most days but it was mainly light, except for a fall of 227 points during the 24 hours ending 0100Z on February 12th.

Winds and Seas:

The ship, Ferdinando Fassio during its passage was about 150-200 miles from the centre of the cyclone. This ship reported winds of 35 knots on several occasions, but it is likely that winds were stronger nearer to the centre. No information was available on the state of the sea although the wind distribution suggested that seas would have been rough in the vicinity of the centre.

Damage:

No damage was reported.

Depression 4C, Type C, 13th-16th February 1958

04C58 13162 (71407 71606 71808)

Development:

This centre with a pressure of 1000 mb was located in the north-east Indian Ocean at about latitude 14°S , longitude 107°E at 0700Z on February 13th. Deepening to 993 mb by 0100Z on February 14th, the centre maintained this intensity until 0100Z on February 15th. After this rapid filling occurred.

Track:

Initially this centre moved to the south-west taking a parabolic path. Curvature to the south-east began at about 0100Z on February 14th, and the centre's final position was at approximately latitude 18°S , longitude 108°E .

Rainfall:

No rainfall information was available over the ocean areas.

Winds:

Ships reported winds of 30 knots at positions several hundred miles from the centre. However the pressure gradient indicated that winds of the order of 40 to 50 knots could have been recorded near the centre.

Damage:

No damage was reported.

Depression 5C, Type C, 1st-5th March 1958

(05C58 01053 (71618 71914 72214 72518))

Development:

This centre with a pressure of 1002 mb was located at 16°S , longitude 118°E , or approximately 250 miles west-north-west of Broome at 0100Z on March 1st. The first advisory warning was issued at 0700Z on this day.

Little development was evident during the first 24 hours, but in the succeeding 24 hours rapid deepening occurred, the pressure falling to 988 mb.

The cyclone advices issued provided ample warning of the development and movement of the system. Strengthening upper winds at Broome and Port Hedland were a useful aid in defining the position of the centre; and reports from the ship Tamashima Maru on a southerly course at longitude 115° aided the determination of its velocity.

Track:

The cyclone assumed a parabolic path with a speed of 5 to 10 knots, crossing the north-west coastline just west of Onslow at 0700Z on March 4th. As the centre moved inland it increased its speed to about 15 knots and finally dissipated in the vicinity of Wiluna. The track was typical of cyclones developing off the north-west coast.

Rainfall:

Heavy rain was recorded over the De Grey and Fortescue divisions during the passage of the cyclone, many stations reporting falls of the order of 3 to 5 inches during the period. High 24 hour registrations were Mardie with 300 points and Wittenoom 263 points.

Winds and Seas:

Gale force winds of the order of 40 knots were recorded at Onslow and by the ship, Tamashima Maru. Generally winds of this velocity were maintained for about 48 hours within 150 miles of the cyclone centre.

Rough seas were reported from NW Cape and also from ships in the area.

Damage:

Notes received from Elder Smith's representatives at Onslow and published in "Elders Weekly" of 3rd April 1958 indicated that considerable damage was inflicted upon property in the town, but no lives were lost. According to these representatives, gusts reached 107 miles per hour during the afternoon of March 4th. Sheets of iron were removed from roofs, fences were blown over, and large rain water tanks scattered.

Depression 6C, Type C, 14th-16th March 1958

06C58 14163 (71915 72114 72215 72317 72522)

Development:

Although a general low pressure area was in existence over tropical waters off the north-west coast for several days prior to March 14th, there was little indication of cyclonic development until 0100Z on this day when a centre of 1002 mb pressure became evident about 100 miles north of Onslow. The centre began to deepen and a warning was issued at 1130Z. By 0100Z on March 15th the centre had deepened to 996 mb. Detection and movement were aided by surface isallobaric changes ~~and the changes~~ and the changes in the upper wind pattern.

Track:

Moving with an initial speed of about 5 knots, the cyclone assumed a course similar to the one at the beginning of the month. At 0700Z on March 15th the centre had reached a point about midway between NW Cape and Onslow. Its central pressure at this stage was 990 mb. Passing very close to Onslow about 1200Z on this day, the centre increased its speed to about 10 to 15 knots and began to weaken. By 0100Z on March 17th, the centre had reached a point about 150 miles northeast of Wiluna with a central pressure of 1007 mb. It continued on a south-easterly course as a weak low reaching the head of the Bight about 1200Z on March 18th and passed southwest of Tasmania about 0100Z on March 20th.

Rainfall:

Heavy rain of the order of 5 to 10 in. was received over the Fortescue divisions and moderate to heavy rain fell over much of the interior of the State. High 24 hour recordings were 1114 points at Onslow and 420 points at Mardie during the 24 hours ending 0100Z on March 16th.

Winds and Seas:

Gale to hurricane force winds were experienced within a radius of 200 miles of the centre with rough to high seas. Onslow reported winds of 84 knots with a maximum gust of 120 miles per hour as the centre passed near to the township. Mardie and Northwest Cape also reported winds of 35 to 40 knots.

Damage:

Damage to the township of Onslow was widespread. The ocean broke through the foreshore and water ran through the town carrying debris which caused considerable damage to buildings. The jetty was severely shattered, while the hospital suffered damage to its roof and walls.

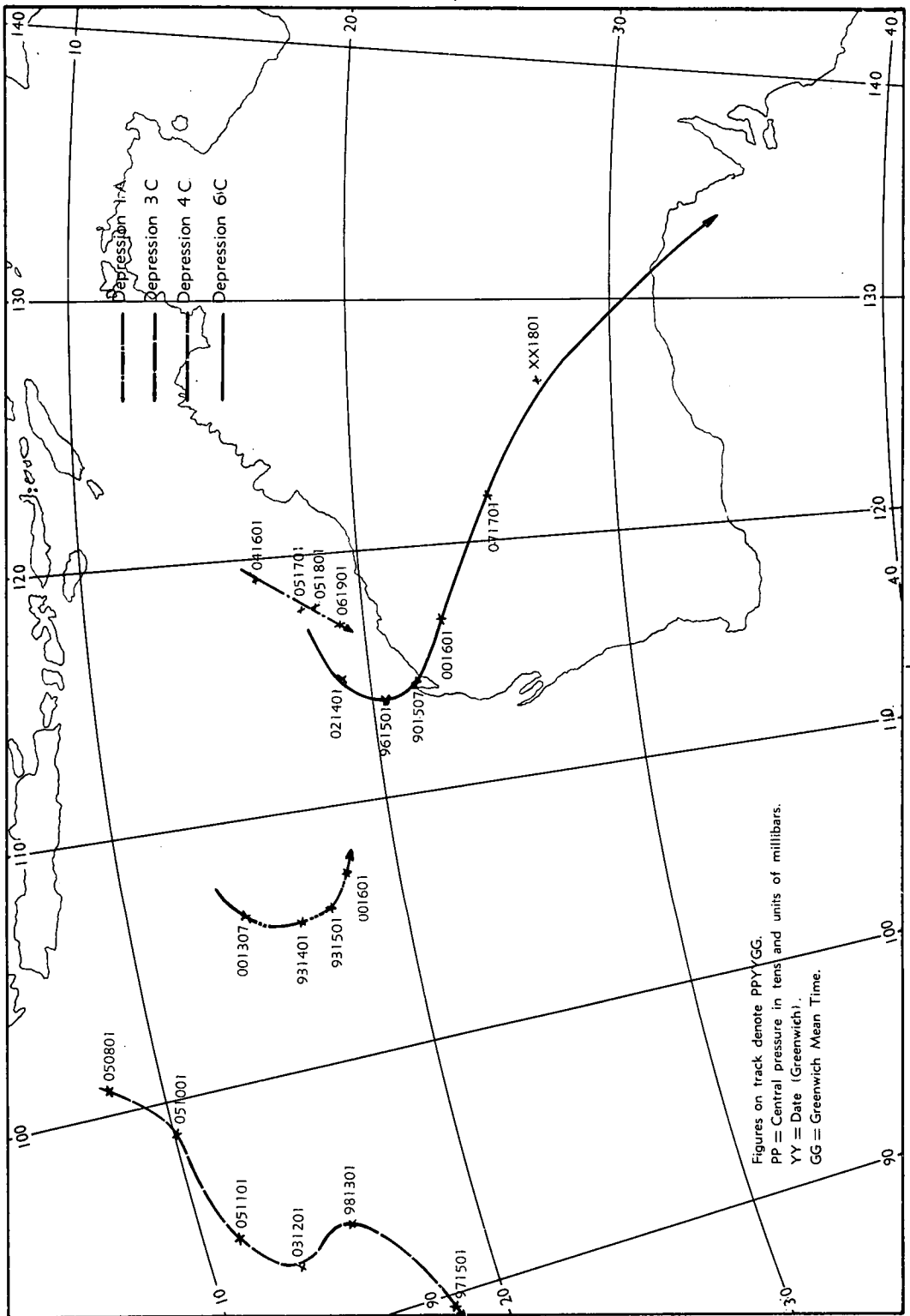
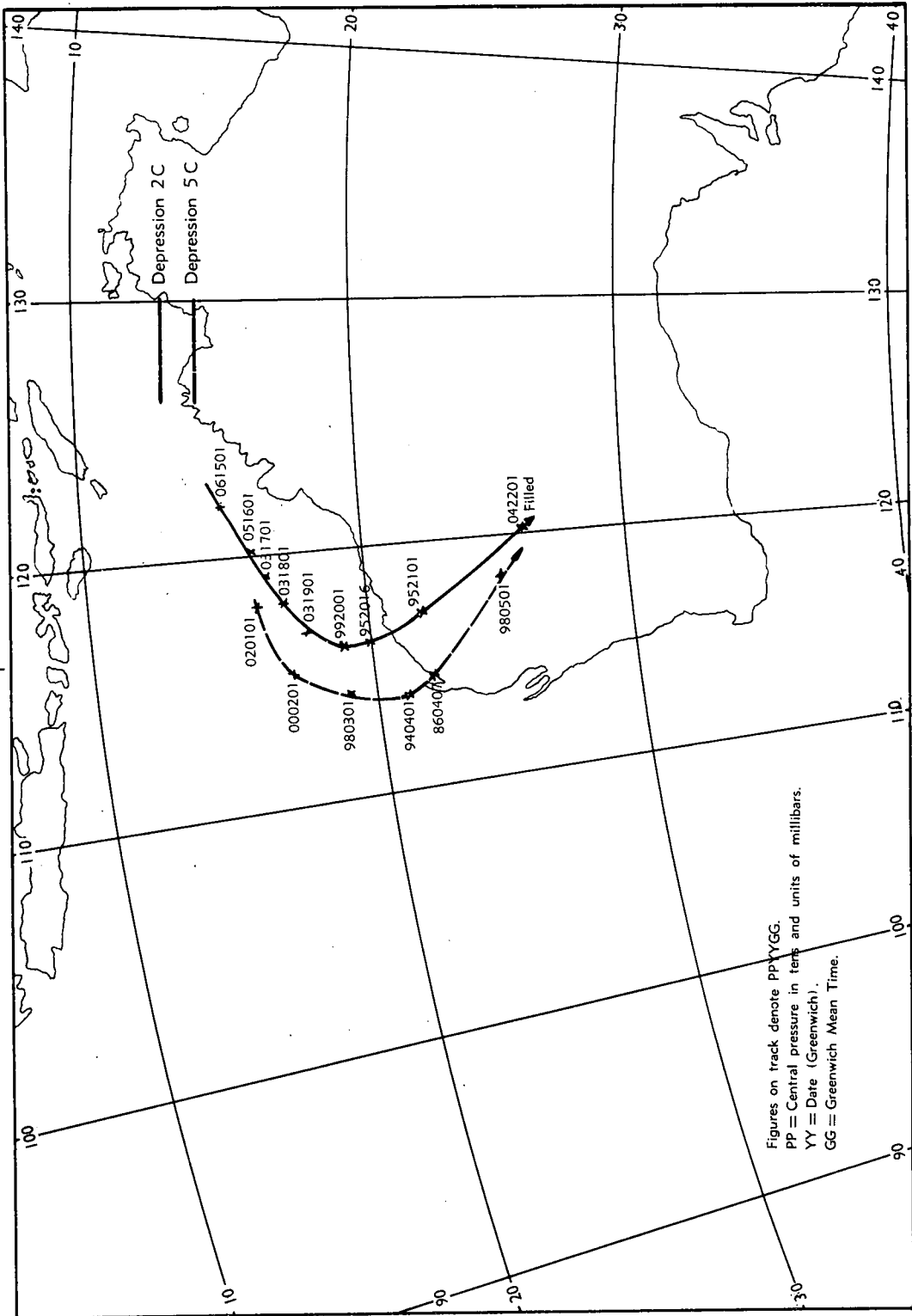


Fig. 1. Track of depressions 1A, 3C, 4C, and 6C.



Figures on track denote PPYYGG.
 PP = Central pressure in tenths and units of millibars.
 YY = Date (Greenwich).
 GG = Greenwich Mean Time.

Fig. 2. Track of depressions 2C, and 5C.