

Climate 11



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11 CLIMATE

11.1 INTRODUCTION

This section describes the climate and meteorological patterns relevant to the Eastern Leases Project (the project) and identifies climatic extremes.

11.2 REGIONAL CLIMATIC PATTERNS

Groote Eylandt experiences a tropical climate which is characterised by hot humid summers during which the majority of rainfall occurs, and dry winters. The prevailing winds in the region are from the east. However, during the active monsoon season which occurs between November and April, north-westerly winds draw in moist air from the ocean, leading to heavy rainfall periods, typically associated with intense storms and cyclones. There are an average of three cyclones per year.

11.3 CLIMATE STATISTICS

Climate data has been collected since 1999 from the Bureau of Meteorology (BoM) meteorological station at Groote Eylandt Airport (BoM weather station number 014518). This meteorological station is located approximately 6.7 km to the north-west of the project site, at its closest point (Figure 11-1). Table 11-1 and Table 11-2 present a summary of the primary meteorological parameters recorded at this station.

Table 11-1 Summary of Climate Statistics

MONTH	TEMPERATURE ¹ (° C)		RAINFALL ²		RELATIVE HUMIDITY ³ (%)	
	Mean Minimum	Mean Maximum	Mean (mm)	Mean Rain Days	9am	3pm
January	25.1	33.3	240.9	15.1	77	68
February	24.9	32.9	242.4	14.9	78	69
March	23.7	32.3	333.1	15.5	79	70
April	21.7	32.3	162.1	9.7	75	65
May	19.0	31.0	27.0	3.5	70	56
June	16.5	28.8	5.0	0.8	69	57
July	15.4	28.7	3.6	0.4	70	51
August	15.0	30.1	0.9	0.1	65	46
September	17.9	32.6	2.7	0.6	61	49
October	21.1	34.2	27.7	2.6	61	50
November	23.5	34.3	130.2	7.5	65	56
December	25.0	34.2	185.0	11.3	71	62
ANNUAL	20.7	32.1	1,326.4	82.6	70	58

1. Recorded between May 1999 and July 2014 at the BoM meteorological station at Groote Eylandt Airport

2. Recorded between May 1999 and September 2014 at the BoM meteorological station at Groote Eylandt Airport

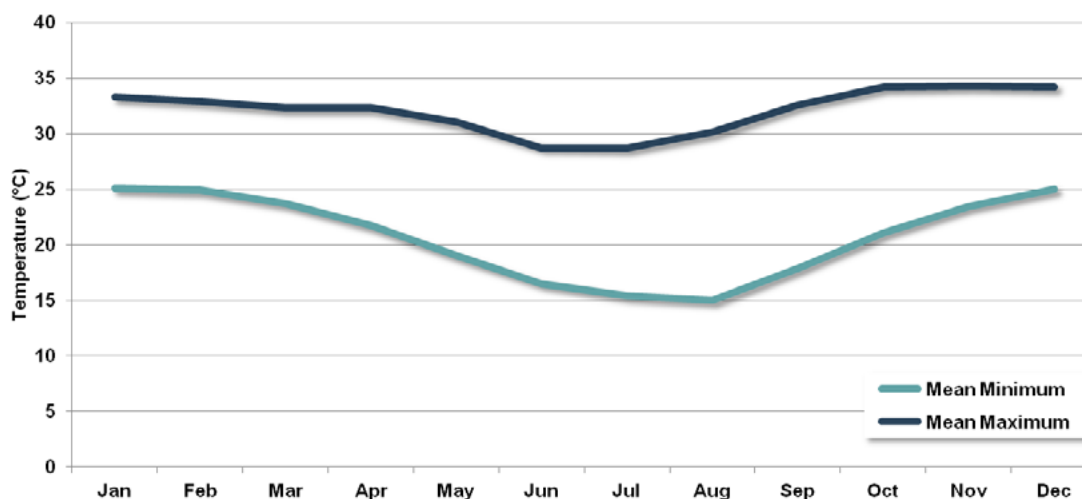
3. Recorded between May 1999 and September 2010 at the BoM meteorological station at Groote Eylandt Airport

11.3.1 Temperature

Table 11-1 provides the mean minimum and maximum monthly temperatures recorded at the BoM meteorological station at Groote Eylandt Airport.

The monthly mean temperatures are typical of the tropical climate, with relatively warm temperatures all year round and slightly cooler temperatures from June to August, as shown in Graph 11-1. The highest mean daily maximum temperature recorded was 34.3°C for November, and the lowest mean daily minimum temperature recorded was 15.0°C for August. Annual mean temperatures range between 20.7°C and 32.1°C.

Graph 11-1 Mean Minimum and Maximum Monthly Temperatures

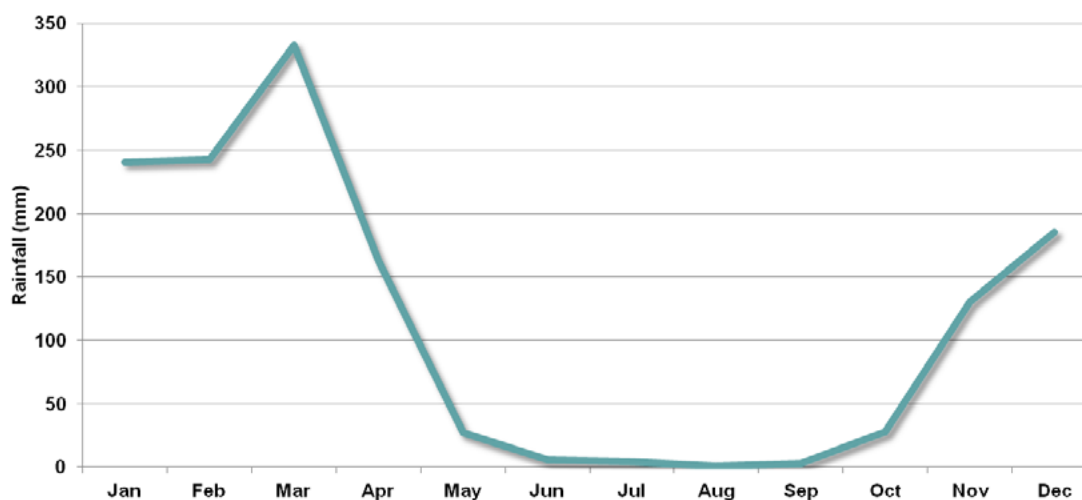


11.3.2 Rainfall

Table 11-1 provides long-term averages and number of rain days recorded at the BoM meteorological station at Groote Eylandt Airport.

The annual pattern of rainfall illustrates the tropical climate in the region, with 97% of the annual rainfall occurring during November to April. Just 1% of the annual rainfall occurs in the winter months of June to August. The highest mean monthly rainfall recorded was 333.1 mm in March, and the lowest mean monthly rainfall was 0.9 mm in August (Graph 11-2). Annual mean rainfall is 1,326.4 mm.

Graph 11-2 Mean Monthly Rainfall

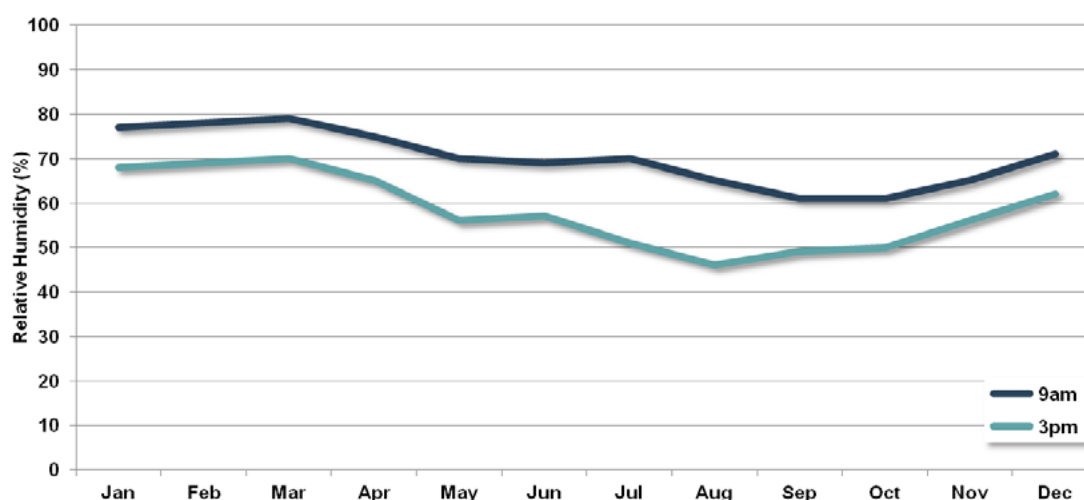


11.3.3 Relative Humidity

Table 11-1 provides Relative Humidity (RH) values based on long-term average measurements collected daily at 9 am and 3 pm from the BoM meteorological station at Groote Eylandt Airport.

Relative humidity was on average approximately 14% higher at 9am than at 3pm during the summer months, and approximately 33% higher at 9am than at 3pm during the winter months. These differences are considered typical of this region and are due to moisture in the morning air evaporating as the day progresses. The higher variation in relative humidity at 9am compared to 3pm over the winter months (as shown in Graph 11-3) is due to a lack of rainfall at this time of year (refer to Graph 11-2). On average RH is approximately 58% higher in the morning in comparison to the afternoon. The highest monthly average RH value was recorded in March for both morning and afternoon values (79% and 70%, respectively).

Graph 11-3 Relative Humidity Recorded at 9am and 3pm



11.3.4 Winds

Table 11-2 provides a summary of the wind speeds and direction recorded at the BoM meteorological station at Groote Eylandt Airport.

The most prevalent wind speeds recorded are moderate winds ranging from 2m/s to 4.99 m/s measured 45.4% of the time. Strong winds greater than 5 m/s were measured 11.5% of the time. A high proportion (24.6%) of winds were recorded as calm (i.e. winds of 0 m/s).

The predominant winds are from easterly directions, with 59.6% of winds occurring from the north-east and south-east (Graph 11-4). Winds from the south to south-west are the most infrequent.

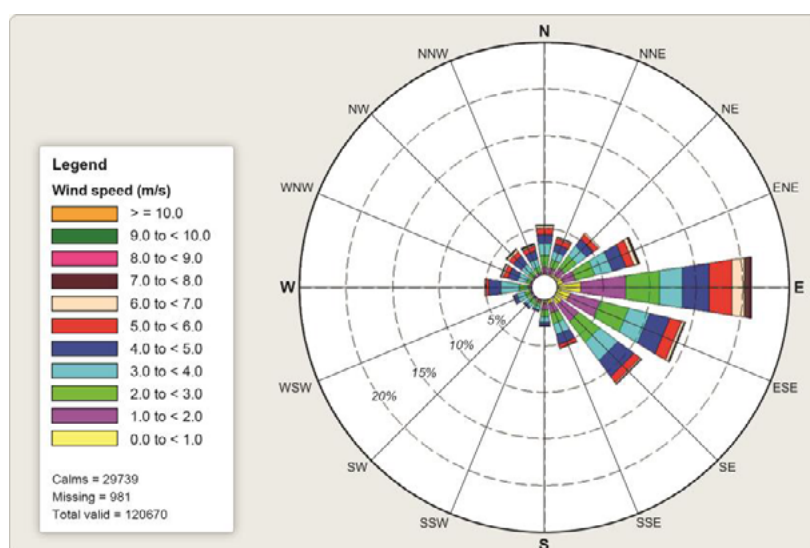
Table 11-2 Summary of the Wind Speed and Wind Direction

WIND DIRECTION	DISTRIBUTION OF WIND SPEEDS ¹ (% OF TOTAL WINDS)			
	Light Winds > 0 – 1.99 m/s	Moderate Winds 2 – 4.99 m/s	Strong Winds > 5 m/s	All Winds > 0 m/s
N	0.6	2.6	0.8	4.0
NNE	0.6	2.0	0.6	3.2
NE	0.9	2.9	0.6	4.5
ENE	1.5	4.2	1.2	6.8
E	5.5	6.8	3.4	15.7

WIND DIRECTION	DISTRIBUTION OF WIND SPEEDS ¹ (% OF TOTAL WINDS)			
	Light Winds > 0 – 1.99 m/s	Moderate Winds 2 – 4.99 m/s	Strong Winds > 5 m/s	All Winds > 0 m/s
ESE	3.5	5.8	1.3	10.6
SE	2.3	5.5	0.8	8.6
SSE	1.1	2.6	0.4	4.1
S	0.7	1.3	0.1	2.1
SSW	0.3	0.7	0.0	1.0
SW	0.2	0.9	0.0	1.1
WSW	0.2	1.4	0.0	1.6
W	0.3	3.2	0.4	3.9
WNW	0.2	1.9	0.6	2.7
NW	0.2	1.9	0.7	2.9
NNW	0.2	1.8	0.6	2.6
All directions (100%)	18.4	45.4	11.5	75.4
Calms (0 m/s)	24.6			

1. Recorded between 2000 and 2014 at the BoM meteorological station at Groote Eylandt Airport

Graph 11-4 Wind Speed and Wind Direction

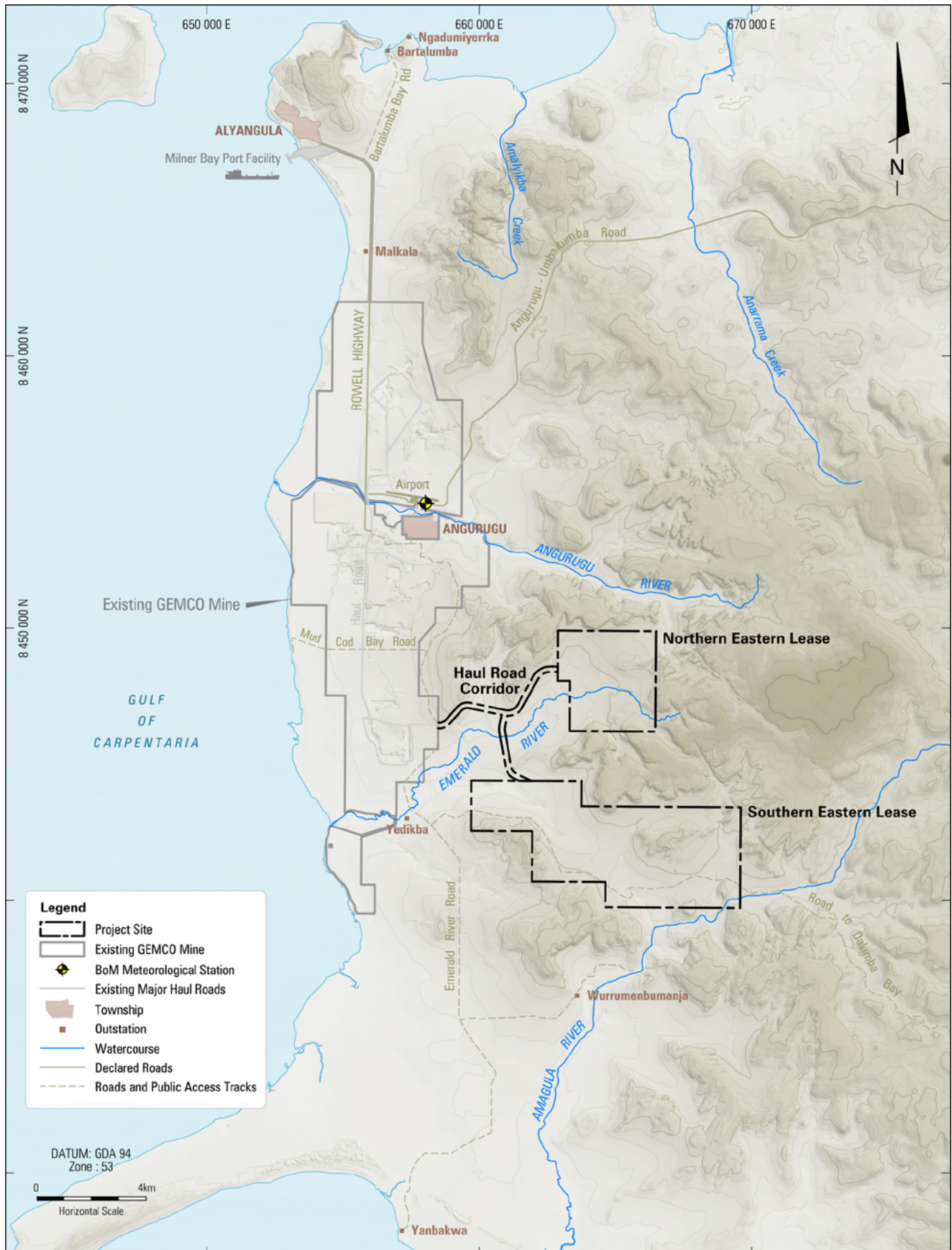


11.4 EXTREMES OF CLIMATE

The project site experiences cyclonic winds and monsoon rains during the summer months. Flooding associated with cyclones, storms and low monsoonal troughs frequently affect the region. Flood hazards are described in Section 10 – Surface Water.

The greatest risk of bushfire usually occurs after the dry winter/early spring period and before the onset of rain over the summer months. It is at this time that lower relative humidity, high winds and lack of rain are common. Key strategies to minimise the risk of bushfire are described in detail in Section 18 – Health and Safety.

FIGURES



EASTERN LEASES PROJECT

Location of BoM Meteorological Station

FIGURE 11-1