

CLIMATE

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Continental Australia and Tasmania form a broad landmass that has a wide latitudinal extent (10-44°S) with a diversity of climates, ranging from tropical to temperate, and from rainforest to desert. Rainfall, temperature and evaporation maps (Figure 1) indicate general patterns of decreasing rainfall and increasing summer (January) temperatures away from the coast; in comparison, winter (July) temperatures are more latitudinally controlled. Annual evaporation exceeds 2000 mm throughout the semi-arid and arid regions, with the maximum exceeding 4000 mm. Climatic variations due to altitude are only marked in the Eastern Uplands, particularly in the highlands of the Australian Alps of southern NSW and Victoria, and in the highlands of Tasmania.

The complexity and variability of climate almost defy useable classification other than into a few broad groups. However, such groupings are adequate for discussion of regional pedology and geomorphology. The most widely used classification is that of Köppen (1936), which is based on the distributions of native vegetation communities, and depends on monthly and annual temperature and precipitation.

Climatic regions based on the Köppen classification, as modified by Stern *et al.*, (2000) are shown in Figure 2 and described in Table 1. The most important boundaries are: -

- Between the tropical and sub-tropical to temperate humid climates, based on temperature, and

- Between humid and dry climates, based on a temperature-rainfall function (rainfall effectiveness).

Subdivision in the humid equatorial and tropical climates is based on seasonal rainfall distribution and the occurrence of a dry season, defined as months having <60 mm rain. Methods for calculating these boundaries are given by Stern *et al.*, 2000.

From the central west and central south coasts through to the Eastern Uplands and the northern tropics, the continent is dominated by the belt of dry savanna, semi-arid and arid climates of the grasslands and deserts. In the north of this belt, the dry savannas have monsoonal summer rainfall, whereas to the south, seasonal patterns in the semi-arid and arid areas are ill-defined or tending to winter rainfall, associated with cold fronts from the Indian and Southern Oceans.

Humid climates occur mainly along the northern, eastern and southern margins of the continent as follows: -

- Equatorial to tropical humid savanna climates are restricted to Melville and Bathurst Island, N of Darwin, and the northern tip of Cape York.
- Tropical rainforest climates occur only along the E coast of Cape York.

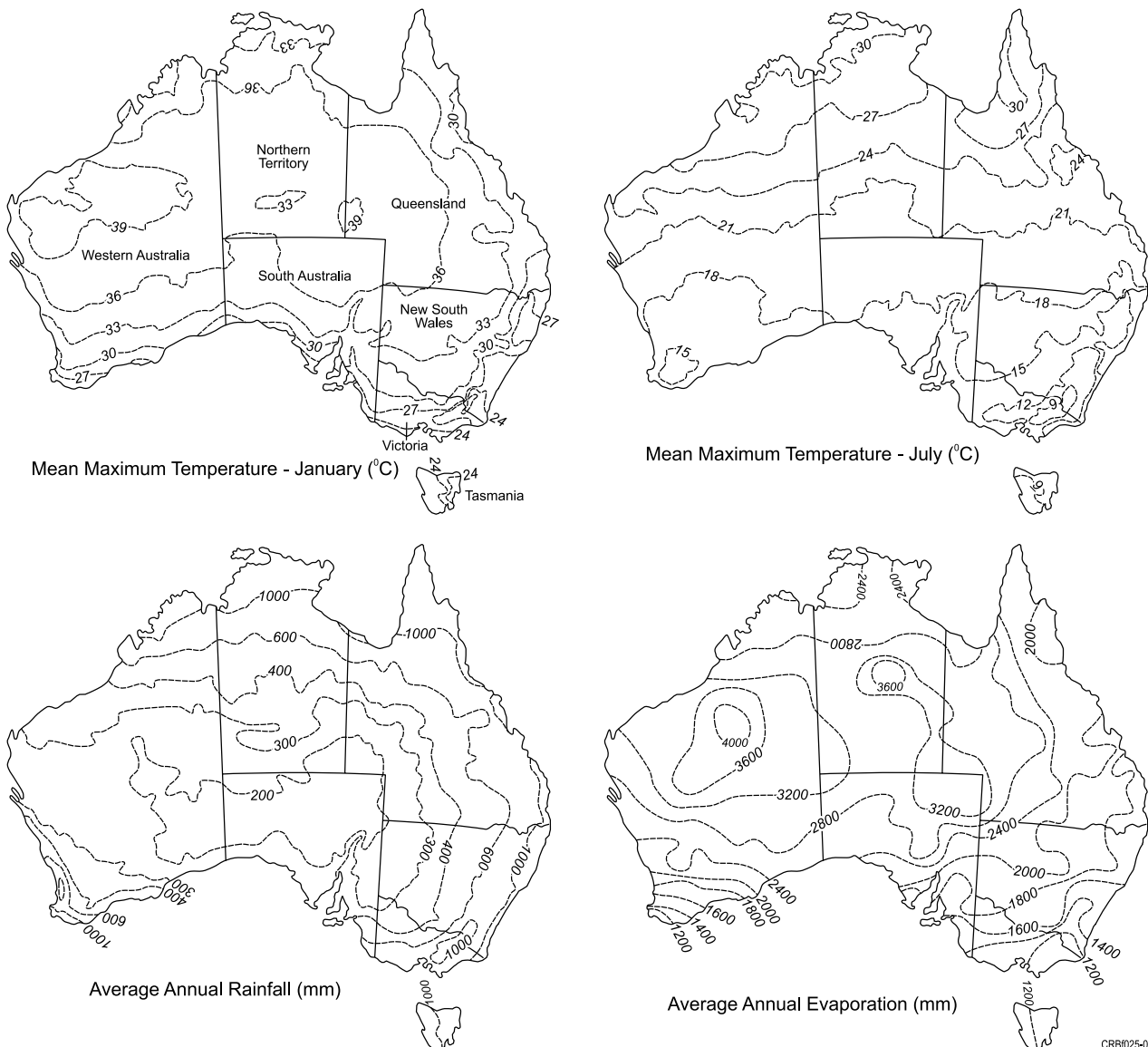


Figure 1. Temperature, rainfall and evaporation maps for Australia. (Bureau of Meteorology Australia, 2004).

- Tropical humid savanna climates, characterized by rainfall of 800-1800 mm pa and a marked 3-5 month dry season prevail across northern Australia from the Kimberley to Cape York.
- Humid subtropical to temperate climates occur along the eastern seaboard, extending 150-300 km inland from the coast.
- Mediterranean climates (hot dry summers and cool wet winters) occur along the coastal margins of western Victoria, SE South Australia and SW Western Australia.

REFERENCES

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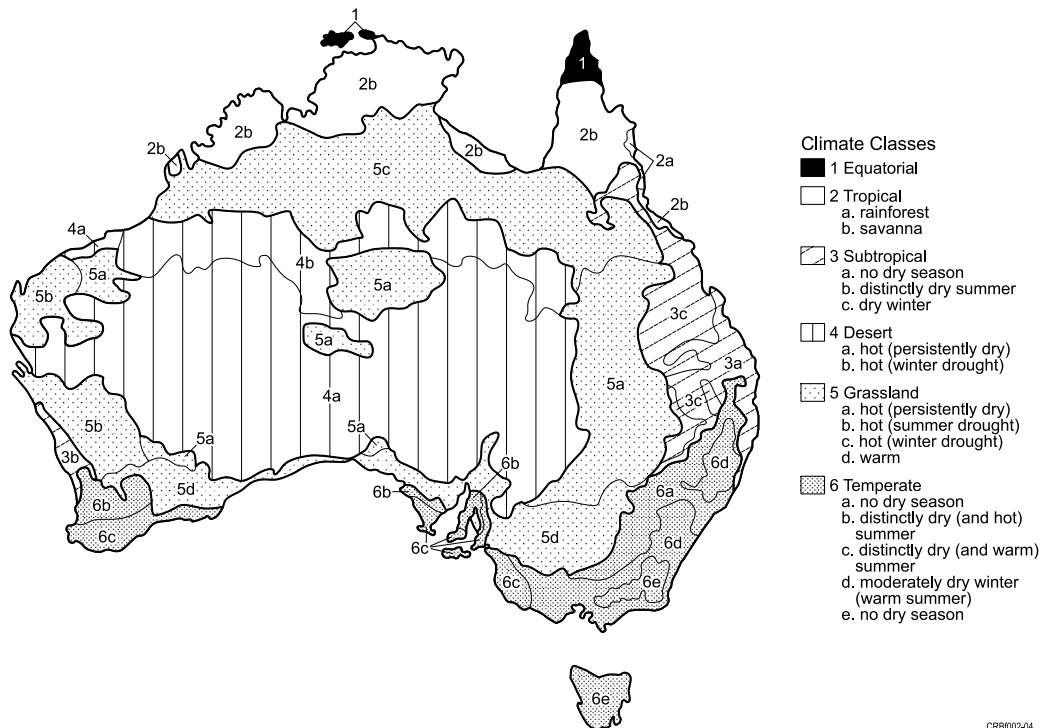


Figure 2. Principal climatic regions in Australia, based on the modified Köppen classification (after Stern et al., 2000, and Bureau of Meteorology, 2004). For subdivisions, see Table 1.

TABLE 1 – CLIMATE CLASSIFICATION

Climatic Zone		Köppen equivalent	Mean annual rainfall (mm)	Mean annual temperature °C	Description
1. Equatorial				24-27°	
	Savanna	Aw	1200 - >1800		Moist savanna with short dry season; <60mm rainfall, driest month
2. Tropical				24-27°	
a	Rainforest	Af, Am	> 1800		Rainforest, part monsoonal; very short or no dry season; warmest month: 27-29°C
b	Savanna	Aw	800 - 1800		Moist savanna; dry season: 3-5 months, rainfall <60mm, driest month; temperature warmest month: 27-32.
3. Sub-tropical			400->900	16-21°	
a	No dry season	Cfa			Long hot summer, mild winter
b	Distinctly dry summer	Csa			Long hot summer, mild wet winter, (Mediterranean)
c	Dry winter	Cfa			Long hot summer, mild winter,
4. Desert			<250	>18°	
a	Hot; persistently dry	BWh		21-28°	Arid; erratic rainfall
b	Hot; winter drought	BWh		21-28°	Arid; erratic monsoonal to sub-cyclonic summer rainfall (>30mm in wettest summer month)
5. Grassland			250-800		
a	Hot; persistently dry	BSfh		21-27°	Sub-humid, dry savanna to semi-arid; uniform erratic rainfall
b	Hot, winter drought	BSwh; BWh		21-27°	Sub-humid, dry savanna to semi-arid; summer rainfall (>30mm in wettest summer month)
c	Hot; summer drought	BSsh		>18°	Semi-arid; rainfall erratic, uniform to winter rainfall (>30mm in wettest winter month)
d	Warm; persistently dry	BSfk		<18°	Semi-arid; rainfall erratic, uniform to winter rainfall (>30mm in wettest winter month)
6. Temperate			400->900	<18°	
a	No dry season	Cfa			Long hot summer, mild-cool winter,
b	Distinctly dry, hot summer	Csa, BSsk			Long hot summer, mild-cool winter
c	Distinctly dry hot summer	Csa, Csb			Long summer, mild-cool, wet winter (Mediterranean)
d	Warm summer; no dry season	Cfb			Long summer, cool winter
e	Mild summer, no dry season	Cfb, Cfc			Long summer, cool to cold winter

Modified Köppen climate classification (after Stern et al., 2000, and Bureau of Meteorology Australia, 2004). For distribution, see Figure 2.