

## **DRIES, WETS & TROPICAL CYCLONES – WEATHER PATTERNS IN THE KIMBERLEY**

On 7 August 2002, Glen Cook from the Bureau of Meteorology in Perth presented an illustrated talk to Kimberley Society. He has been a weather forecaster for 12 years, including 3 years in Katherine, so he had had direct experience of weather similar to that in the Kimberley.

The Kimberley starts at 20° South, the weather being hot and humid with dominant summer rainfall. The vegetation is tropical savannah in the north and grassland in southern parts with a winter drought.

Glen showed how the Kimberley climate is driven by the global pattern. In the Southern Hemisphere there tends to be a westerly surface airflow between the equator and the north of Australia in the wet season. Below this, a high pressure ridge centred roughly on Australia exists around the world forming a succession of anticyclones, and below this a belt of low pressure circles the world, the top reaching the southern part of Australia. These belts are situated further south in summer than in winter. In our summer a low pressure trough tends to form, bringing the Wet to the Kimberley. In winter, the anticyclonic winds of the high pressure ridge through Australia bring dry south-easterly overland winds to the Kimberley.

In the past, forecasters depended heavily on weather information from ships. With fewer ships this source of information has diminished greatly but has been offset to advantage with satellite images of cloud patterns. For instance, the whiter the clouds the colder and higher they are. The pattern changes in springtime with heat lows forming in the Kimberley. The wet season begins with the resulting clockwise rotation of wind around the low, which draws moisture in from the Indian Ocean. Thunderstorms are frequent.

The wettest month is January and the driest is in August. It is hottest in November, frequently over 39° C, as there is little cloud and the air is dry. At night, December is hottest with a mean maximum of 24° C. The coolest mean maximum and minimum temperatures occur in July.

The first Kimberley weather observations were from Derby in 1883.

Extremes from the Kimberley are:

- Highest Maximum Temp: 47.9° C at Fitzroy Crossing on 1 January 1969
- Lowest Maximum Temp: 11.4° C at Halls Creek on 19 July 1975
- Highest Minimum Temp: 33.5° C at Cadjebut on 1 March 1998
- Lowest Minimum Temp: -1.3° C at Mt Elizabeth Station on 26 June 1998

- Highest daily rainfall: 635 mm at Kilito Station NE of Broome on 5 December 1970
- Highest monthly rainfall: 1321.7 mm on Roebuck Plains Station in January 1917

Most cyclones cross the Pilbara coast rather than the Kimberley coast as they usually form to the west and move south. The formation and tracking of cyclones is done via satellite and radar. Radar stations are at Wyndham, Halls Creek, Broome, Port Hedland, Dampier and Learmonth.

Glen thought the biggest threat to life from cyclones was the storm surge. At Thangoo Station the surge from Cyclone Sam breached the old vegetated line of sand dunes 2 kilometres inland creating two wide gaps carrying a large volume of sand further inland. Wind of course can be extremely damaging, stripping branches and all the leaves off trees and demolishing buildings such as the Tourist Resort at Eco Beach.

Glen completed his talk by advertising a booklet: *Kimberley Climatic Survey* costing \$12.95.

In discussion that followed Glen said the effect of El Nino and La Nino are important for the Kimberley. El Nino suppresses the wet season so it is often drier with fewer cyclones, though even one cyclone can bring more than average rainfall to a large area. La Nino has the opposite effect. The early stages of El Nino are apparent at present and it is expected to develop by the end of this year.

Satellite information is free to all and it is important for the world forecasting that it stays that way. Small meteorological stations such as the one in Perth could not afford to pay for such information. The satellite presently providing such information is at the end of its life but a new Japanese satellite is due to replace it.

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