

# Climate and Hydrology of Cubberla Creek

**by John Carter**

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John Carter started as a Pasture Agronomist with the Department of Primary Industries based in Longreach. He undertook work on vegetation surveys in Queensland's rangelands. He is now working with the Drought Group with the Department of Natural Resources and Mines in Indooroopilly, and has particular involvement with some of the Greenhouse work and the climate probability modelling, together with drought and degradation alert work.

## Abstract

*The climate and hydrology of the Cubberla Creek catchment is quite variable showing both long-term deviations from average and intense short-term variability, in part driven by the El Niño effect. It is useful to examine the longest possible climate record to give insight into this variability. Plant growth is dependent on the pattern of rainfall and climate and integrates the climate signal over periods of months to decades for grass and trees respectively. Tree clearing and other development has almost certainly changed the hydrology of the creek by increasing run-off due to increased areas of hard surfaces and reduced tree transpiration. This development has implications for flooding and erosion as the hard surfaces increase run-off. If we received the rainfall patterns of the 1800s with current levels of development, flooding of the creek and erosion might be more common than indicated on the basis of last century's statistics. Climate change may well provide surprises outside those captured in the known climate record. Global warming is likely to impact on our local climate within our lifetime.*

*Data on the climate of the Catchment is listed under the following headings:*

- Rainfall and climate stations relevant to the Catchment*
- Monthly climate statistics*
- Annual rainfall patterns*
- Extreme events recorded in the Catchment*
- Climate effects on plant growth*
- El Niño and rainfall probabilities*
- Run-off and effects of development*
- Climate change*

*These data and graphics provide a picture of the climatic and hydrological characteristics of the Catchments and their broader geophysical region of the Brisbane region – Brisbane City and the Greater Brisbane area.*

## Data and Graphs

### 1. Rainfall & Climate Stations

The Brisbane region has a number of Rainfall and Climate Stations – these are as follows: 28 locations within about 5km (50% currently operating), 1 climate station (vet school, now closed), 9 pluviograph/river height, 4 manual rainfall stations currently recording – the earliest started in 1887 at the Indooroopilly Bowling Club.

#### 2. Rainfall Stations 1 (\*indicates stations currently in operation)

40452	Brisbane (Mt Ommaney Golf Club)	1971-1990
40238	Oxley Post Office	1898-1971
40295	Kenmore War Vets Home (Pinjara Hills)	1962-2000*
40418	Moggill (Moggill Vet Res Farm)	1968-1976
40673	Brisbane (Jindalee)	1977-1982
40629	Brisbane (Corinda)	1889-1906
40275	Brisbane (Kenmore)	1956-1978
40243	Sherwood (Graceville)	1898-1987
40890	Graceville	1994-2000
40450	Indooroopilly (Long Pocket SCIRO Lab)	1969-2000

#### 3. Rainfall Stations 2 (\* indicates stations currently in operation)

40718	Brookfield (Pendale)	1983-1989
40229	Indooroopilly Bowling Club	1887-1999*
40332	Taringa	1898-1942
40245	Toowong	1898-2000*
40347	Brisbane (Brookfield)	1894-1924
40324	Mount Coot-tha	1964-1975
40533	Mt Coot-tha (Mt Coot-tha ABC 2 BCC)	1971-1994
40574	Brisbane (Chiefswood)	1897-1916
40233	Milton	1898-1951

#### 4. Climate Stations (\* indicates stations currently in operation)

##### Within 10 km

40457	Wacol (DPI AI Centre)	1976-1979
40211	Archerfield (Airport)	1939-1949 and 1985-2000*
40418	Moggill (Vet Farm)	1968-1975
40214	Brisbane (Regional Office Roof)	1887-1976

##### Within 15 km

40214	Samford (Samford CSIRO)	1971-1997
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##### Within 20 km

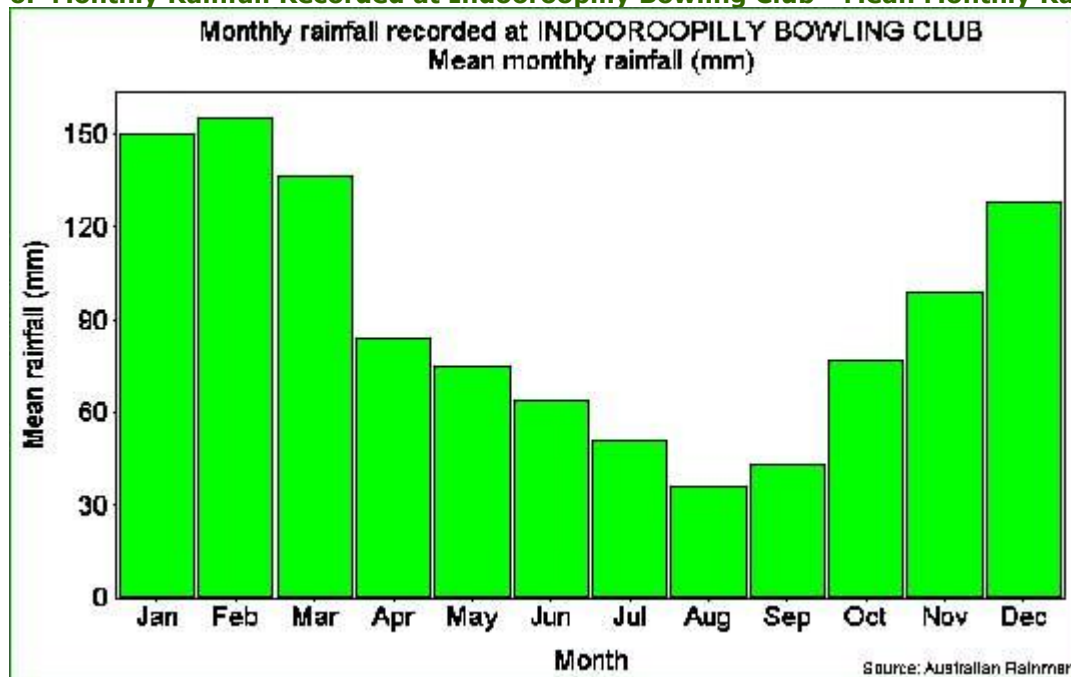
40242	Sandgate	1975-1985
40308	Mt Glorious	1970-1991
40223	Brisbane (Brisbane AMO)	1949-2000*
40101	Ipswich Composite	1975-1993

### 5. Flood Alert/Pluviograph Stations

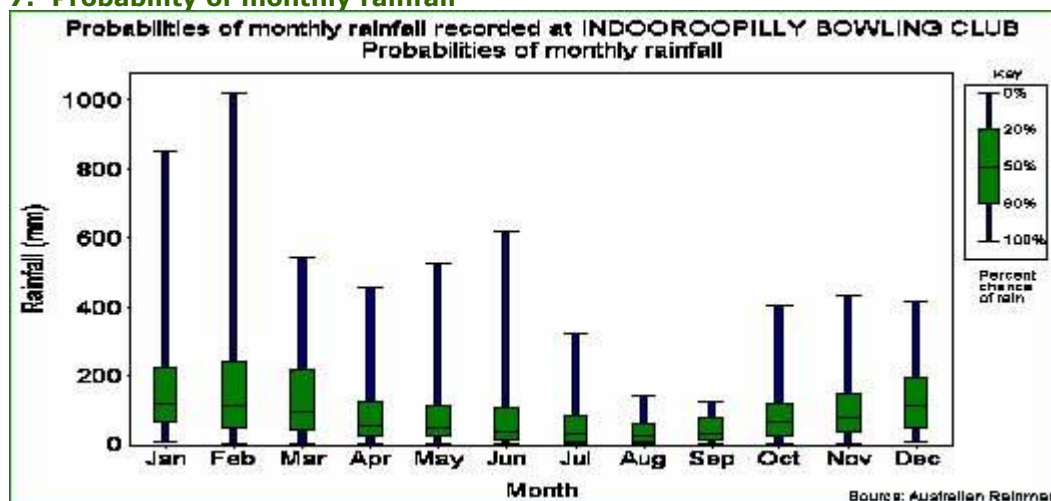
40797	Nosworthy Park Alert (Oxley Creek)
40787	Golf Course Alert (Moolabin Creek)
40713	Jindalee Bridge (Brisbane River)
40720	Misty Morn (Moggill Creek)
40840	Kenmore Alert (BCC)
40898	Mt Coot-tha TM
40821	Enoggera Dam TM (Enoggera Creek)
40494	Bancroft Park TM (Enoggera Creek)

Also Indooroopilly Bowling Club

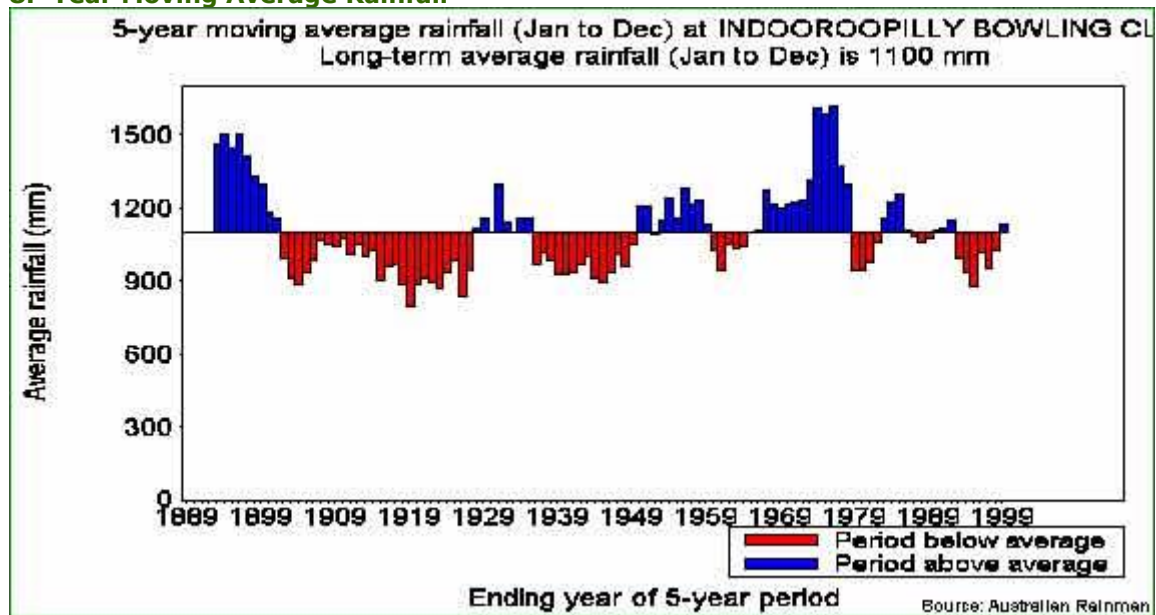
### 6. Monthly Rainfall Recorded at Indooroopilly Bowling Club - Mean Monthly Rainfall



### 7. Probability of monthly rainfall



### 8. Year Moving Average Rainfall

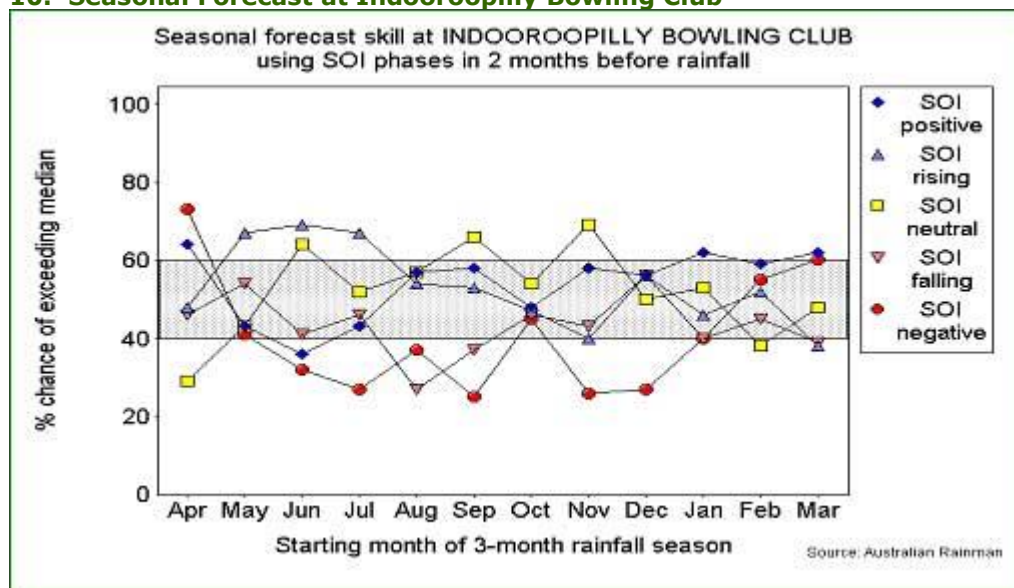


### 9. Extreme Rainfall Events Daily

YEAR	MTH	DAY	RAINFALL(mm)	
1972	4	3	177.5	Brisbane
1974	1	27	179.4	Office
1875	2	24	190.0	BOM
1989	4	26	190.2	
1965	7	20	193.0	
1955	3	28	197.6	
1893	2	16	212.3	
1972	2	12	235.2	
1870	3	9	245.1	
1931	2	6	269.5	
1967	6	12	282.4	
1908	3	14	284.0	
1974	1	26	314.0	
1887	1	21	465.1	

Possible max. precipitation = 472 mm (flood study)

### 10. Seasonal Forecast at Indooroopilly Bowling Club

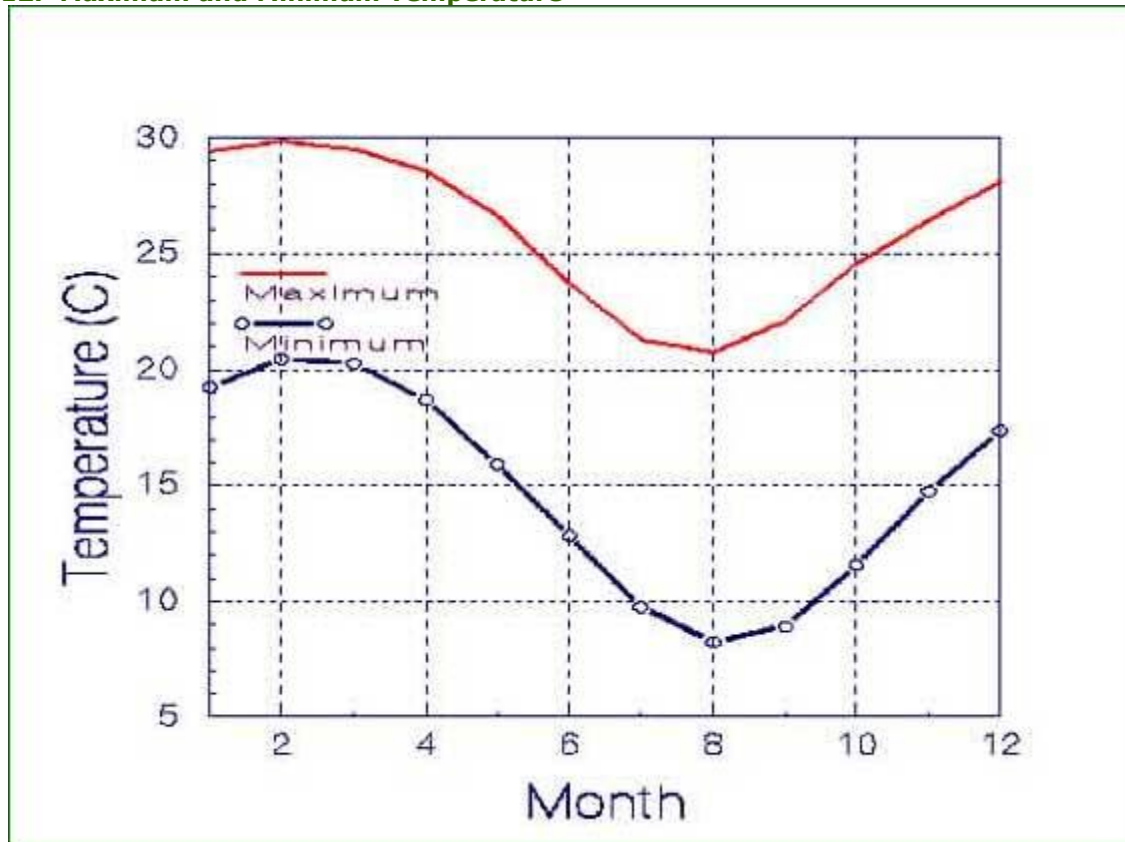


### 11. Chances of Rainfall at Indooroopilly bowling Club Using SOI Phases: July to August:

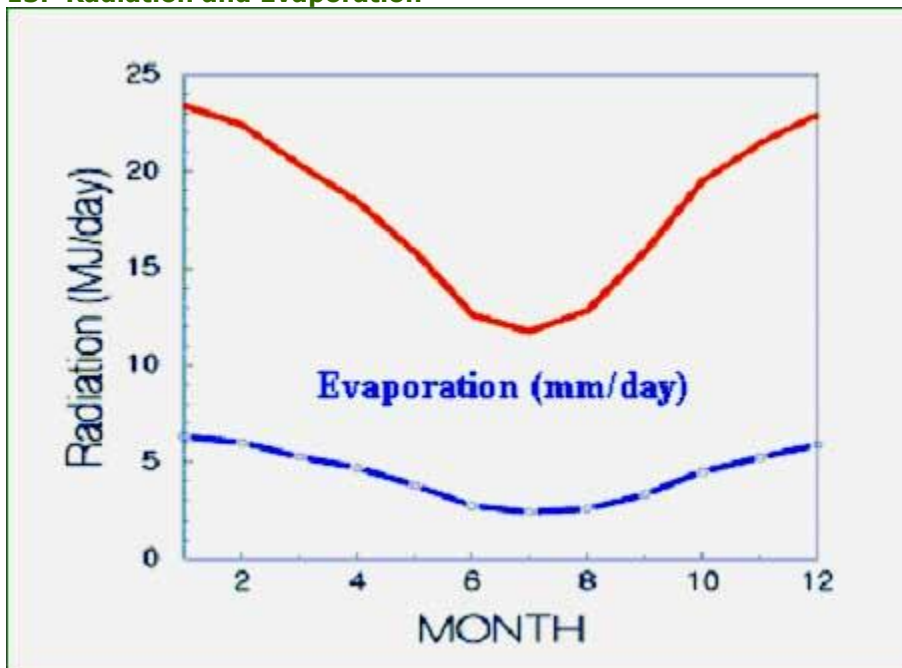
Rainfall period: Sep to Nov	SOI falling	SOI negative	SOI neutral	SOI rising	SOI positive	All years
Rainfall period: Sep to Nov	falling	negative	neutral	rising	positive	years
% yrs with at least 434 mm	0	5	3	5	8	5
300 mm	11	10	31	21	25	21
250 mm	21	15	38	32	38	30
200 mm	37	30	66	53	63	51
150 mm	63	70	76	79	79	74
100 mm	84	80	93	89	96	89
65 mm	95	90	100	95	96	95
% yrs above median 200 mm	37	26	66	53	58	50
KS/KW probability tests	0.665	0.973	0.857	0.146	0.545	0.906
Significance level	NS	*	NS	NS	NS	#
Years in historical record	19	20	29	19	24	111
Highest recorded (mm)	355	608	435	483	586	608
Lowest recorded (mm)	64	37	65	54	50	37
Median rainfall (mm)	175	178	233	206	219	200
Average rainfall (mm)	180	191	245	221	242	219

SOI in its negative phase influences rainfall. Source: Australian Rainman

### 12. Maximum and Minimum Temperature



### 13. Radiation and Evaporation



#### **14. Climate Extremes (Monthly)**

- ♦ Highest Maximum February 1980  
**32.0** degrees **2.1** above long term average
- ♦ Lowest Minimum August 1972  
**5.3** degrees **3.6** below long term average

#### **Bibliography:**

Queensland Department of Natural Resources, Bureau of Meteorology. 1999 (Climate Data Source: SILO Project)

**Source:** Robin Trotter (ed.), *Cubberla and Witton Creeks, Their physical characteristics and land use over time, Proceedings of Symposia held in 2000 and 2001 on the Cubberla and Witton Creek Catchments*, 2001 Brisbane, Cubberla-Witton Catchments Network.