Local Data Sources and Details of Projections

Rainfall was recorded at Murwillumbah Post office and go back to 1890. Between Nov 1968 and Oct 1972 daily rainfall and temperature records were kept by the Condong Sugar Mill until these were taken over by the station at Bray Park. The Mill has records going back to 1908 but only reported monthly averages instead of daily maximum and minimum. From July 1966 there is also rainfall records kept at a number of flood gauges in the Tweed catchment.

Records for Murwillumbah

Rainfall – From 1890, Day =Julian day ie day 20 = Jan 20th, Day 33 = Feb 2nd

Highest daily rainfall

Year	Day	MaxT	MinT	Rain
1972	94	28.5	17	336
1931	37	24	20	331.3
1978	78	28.7	19.3	321
1956	49	28	19.5	311.6
1954	52	27.5	21	294.4
1945	162	17	12.5	289.6
1921	204	19	14	282.9
2001	33	25.7	22.2	275
1890	15	25.5	21	263.7
2004	56	31.7	21.2	263.2
1989	92	24.4	19.9	261.4
1976	42	26.3	16.9	249.2
1972	302	20.7	16.6	244.3
1919	149	20	13.5	241.5
1974	70	27.6	21.1	238.8

Temperature Records from 1890

These records are from the Silo Patch Point Data base which means that for some days prior to 1968 in Murwillumbah a calculated figure is used based on the nearest station that has an actual record for that day. While this means that Jan 26th 1940 ties with 1968 only the 1968 record is official. Note that of the top 15, half have occurred in the last 20 years. Hottest year was 2004 with 15 days over 35 degrees.

Year	Day	MaxT
2002	12	42.9
1940	26	42
1968	324	42
1994	6	41.2
2004	52	40.9
1972	360	40.8
1994	4	40.7
2001	359	40.7
1968	323	40.5
1990	357	40.5
2002	2	40.2
1940	54	40
1981	341	39.7
2009	321	39.6
1901	352	39.5

Please check the Bureau of Meteorology for updates as new records are likely to be set with each year in a warming climate.

Silo Patch Point records are no longer available free of charge however requests can be made for CD copies of data. It is very important to specify the particular recording station, the years in question and the format of the data. The files are usually too large to process in excel and require some programing expertise with programs such as "R".
Data prior to 1958 contains increasingly frequent gaps in the temperature record filled with calculated figures from nearby stations and for this reason has not been used.

Conversion to metric units began in 1970. Generally this is not a problem with rainfall records however temperatures measured in Fahrenheit were rounded to the nearest half degree which means that certain Celsius temperatures do not occur in older records eg 94.5 F is 34.7C and 95F is 35C so early records do not show 34.8C or 34.9C.

Comparing to OEH regional forecasts

OEH forecasts use a base period of 1990 to 2009 which is a time of rapid change. For example the average number of days over 35 degrees in this period is 5 while the moving ten year average changes from 4 to 5.7 over this period.
If an OEH forecast projects 10-20 extra days over 35 C in the period 2060 to 2079 then it is projecting a total average of 15 to 25days. If the base period is taken as the ten year average in 1967 which is 1.1 then the forecast is a 14 to 23 fold increase in the incidence of days over 35C. Please note that figures prior to 1971 will include Maximums of 35 when the actual figure could have been 34.8 or 34.9C because of measurements in Fahrenheit and so inflate the 1967 base figure.

We have taken a very conservative approach to already conservative projections to say that the average incidence of days over 35 degrees has increased 4 fold since 1967 and projected to double by 2030 (9 days) and triple by 2070 (13days).

Rainfall Comparisons

Though the rainfall data is much more complete, rainfall has a much greater range than temperature eg 0 to 336mm per day and is strongly influenced by La Nina and El Nino events. For this reason a 100 year average is used as a base and compared to the 25year average from 1990.

Season Length Forecasts

This technique was pioneered by CSIRO scientists for forecasts in the Hunter region and is based on increases in average maximum temperature. The 2030 forecast uses a 1.3 degree rise by 2030 and 2.6 degree rise by 2050. These figures are based conservatively from the Hadcrut model and fall within the regional projections of the OEH regional forecasts which use a later base date already incorporating 0.6 degrees of warming.
Global model forecasts project mean surface temperature increases over land **and sea** (eg COP21 target to keep global temperature increase below 1.5 degrees). Average temperature increases over land are near double of those over the oceans and also increase sharply with distance from the ocean. Consequently temperatures increase faster at Murwillumbah than at Tweed Heads. Temperature change also varies with latitude. Increases are up to 4 fold higher in polar regions and less than the average in equatorial regions.