A Tasmanian Fire Danger Climatology

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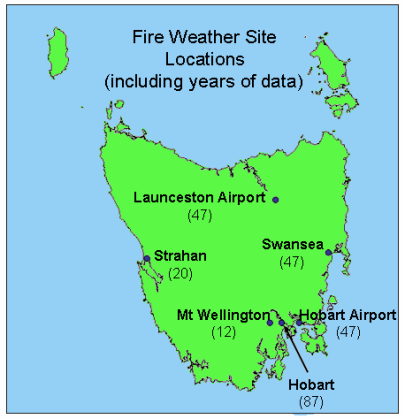
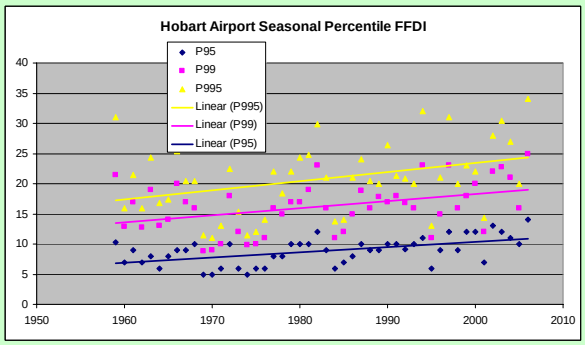
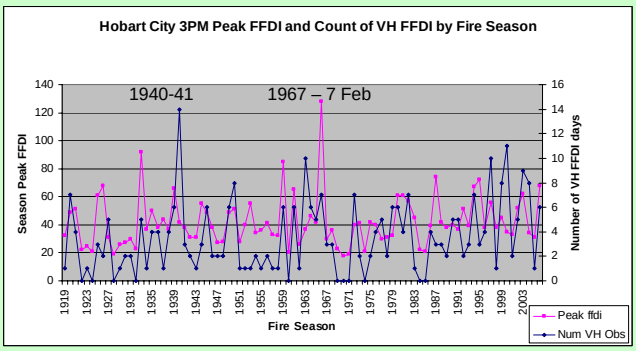
Tasmania is subject to intermittent periods of dangerous fire weather. This project attempts, in the first instance, to characterise its variability.



Three hourly synoptic observations were used to create a history of Mark V McArthur Forest Fire Danger Index (FFDI) at representative locations around Tasmania, using Soil Dryness Index (SDI) as a ground moisture input.



All Hobart Airport synoptic observations were used to construct 95th, 99th and 99.5th percentiles of fire danger for each fire season (defined as July-June the following year). These are plotted above, with corresponding linear regression lines. There is an increasing trend, with a greater increase (but also more scatter) at the more extreme end. Similar plots apply to the other longer term stations.

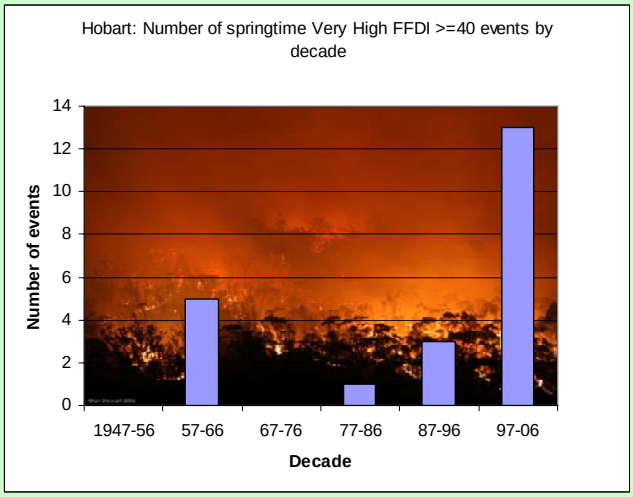


In the case of Hobart, shown above, observation times have varied over the 87 years of digitised data, so only 3pm data is displayed here. Peak seasonal (3pm) FFDI is pink, the number of Very High FFDI observations during the season is blue. There is wide interannual variability, and variability between the two measures of seasonal severity used (although this is certainly a function of sampling only 3pm data).

There does seem to be a trend in the last decade in particular to greater seasonal severity, with more seasons having greater numbers of significant fire weather days.

This trend is evident elsewhere also, for example in the percentile plots in the next column

A focus of this project is springtime fire weather. It turns out that roughly one year in two in eastern and southeastern Tasmania has a “springtime bump” – a period of enhanced fire danger early in the season.



Extending the analysis above, spring has seen an abrupt increase in the number of severe fire weather events (where an “event” is defined as a observation of FFDI >= 40, with possibly more than one event/day) in the last decade or so, as the graph indicates. The background image, by Ian Stewart, was taken on Hobart’s outskirts during 12 October 2006, a day of exceptional springtime fire weather.

What Next?

- 12 October 2006 stands out in the record as an exceptional fire weather day. Its meteorology will be investigated in depth.
- The increase in significant spring fire events seems to be at least partly driven by an increase in episodes of extreme dry air. The broad atmospheric circulation features that might lead to these events will also be investigated.