



Meteorological Aspects of the Wilsons Promontory Fire of April 2005

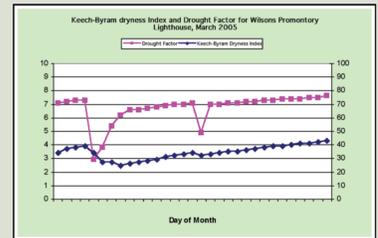
1 Introduction

- The fire was lit as a prescribed burn on 21 March 2005 near Tidal River situated about mid way up the west coast of Wilsons Promontory.
- There were two escapes during relatively mild weather conditions on 25 March and 29 March that were controlled.
- The fire lay dormant in peat on the forest floor in the lead up to 1 April 2005.
- On the night of 1 April, warm windy weather re-ignited the fire and it escaped, burning out almost 7000 Hectares of Wilsons Promontory National Park.
- Some 550 campers were urgently evacuated from Tidal River the next morning and there was no loss of life



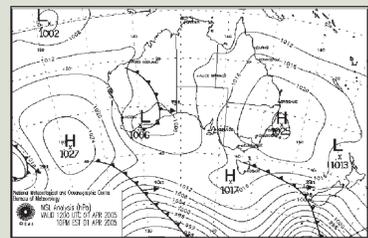
2 Weather and soil dryness leading up to the escape

- The fire occurred less than two months after a major rain event in early February of 2005. Conditions were cooler than average for several weeks and there were only two modest rain events in March, resulting in a monthly total of 33 mm against an average 70 mm.
- The ground slowly dried out with the Byram-Keech index climbing to an estimated 46 by 21 March at Tidal River.
- The trend of both Drought Factor and Byram-Keech index remained upwards at a modest rate during the eleven days leading up to the major escape.



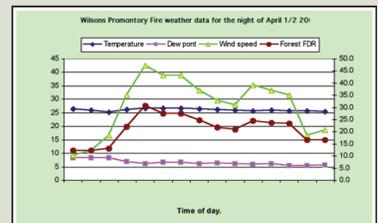
3 The synoptic weather pattern on the day of the escape

- A high pressure system over the Tasman Sea directed warm north to northwesterly winds over Victoria on 1 April 2005.
- A weak cold front was passing to the south of Wilsons Promontory on the night of 1 April and this caused a freshening of warm northerly winds.
- The front failed to bring any rainfall and did not result in any cooling of the airmass.
- Another cold front seen developing over Western Australia subsequently progressed east, tightening the pressure gradient again late on 2 April.



4 Meteorological conditions on the night of the fire escape

- The northerly wind increased dramatically early on the evening of 1 April, peaking at above 40 km/h around 8 pm and remaining fresh all night.
- The temperature remained around 26 degrees all night without the usual diurnal dip to a discreet minimum. The 24-hour minimum temperature to 9 am on 2 April was 23.4 degrees, a record for the station for April.
- The dew-point temperature fell slightly when the wind increased and resulted in relative humidity of just below 30% lasting throughout the night.
- Forest fire danger index peaked at around 31, a value in the very high range, and this is unusual for evening hours.

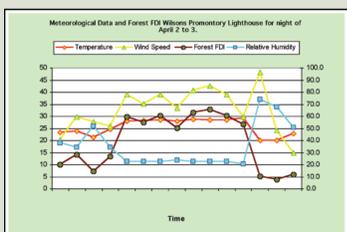


- The fire flared up sometime around 11 pm then quickly spread, spotting across the Tidal River from where it rapidly spread over a nearby mountain range in the National Park.

5 Meteorological conditions on the night following the escape

The meteorological data for the night of 2 April, the night after the fire commenced, were even more alarming and help explain why the fire spread so far:

- Conditions on this second night became windier, warmer and drier than those of the night on which the fire escaped.
- This weather was driven by the approach of the second, stronger trough and cold front that generated a stronger northerly airflow across Victoria than the first frontal system.
- The prefrontal trough moved across Wilsons Promontory just before 6 am on 3 April and was accompanied by a westerly wind change and markedly higher humidity, bringing lower fire danger.



- The cold front arrived later that day with wind exceeding 90 km/h. This change is believed to have spread the fire some distance up the east coast of the promontory.

6 The progressing fire and resulting devastation

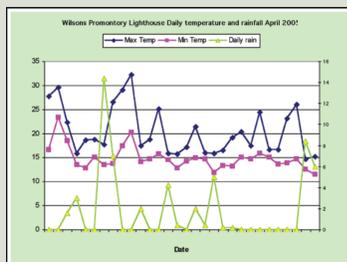
- The fire progressed rapidly in a southeasterly direction and spread all the way to the lighthouse on the southern tip of Wilsons Promontory during the following two days.



Photograph courtesy of Brian Doolan from the Department of Sustainability and Environment, 2 April 2005; Tidal River on the lower right and Mt Oberon, which had been engulfed by the fire the previous night.

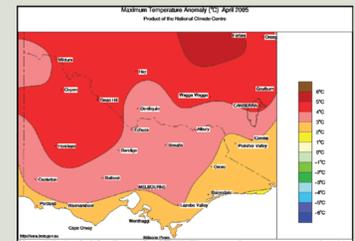
7 Weather during April 2005: a fire fighter's nightmare

- The meteorological data for April 2005 at Wilsons Promontory shows two distinct hot spells early in the month.
- The fire spread around to the eastern side of the promontory, fanned by a gusty cool but dry southwest wind change on the morning of 3 April.
- The second hot spell commenced on 8 April and culminated in a record maximum temperature of 32.2 degrees being recorded on the tenth. This exacerbated the fire.
- The fire was slowly contained following the second hot spell but was not totally extinguished until the cool spell and rain at the end of the month.



8 A record-breaking April

- April 2005 proved to be the warmest April on record across Australia with a mean positive maximum temperature anomaly of 3.11 degrees.
- The record hot April followed a cooler than usual end to the summer over southern Victoria.



Conclusions

- On the night of escape and subsequent night, there was no diurnal recovery in temperature, relative humidity or wind speed that maybe expected in autumn. This weather pattern was reminiscent of a summer pattern, a situation not all that uncommon in April.
- The large variability in weather conditions seen at the end of the fire season of 2004/5 and more recently at the commencement of the 2006/7 season, serves to highlight the risks to prescribed burns.
- Weather forecasts valid to seven days are highly important for planning and monitoring the risk of an escape of a controlled fire.