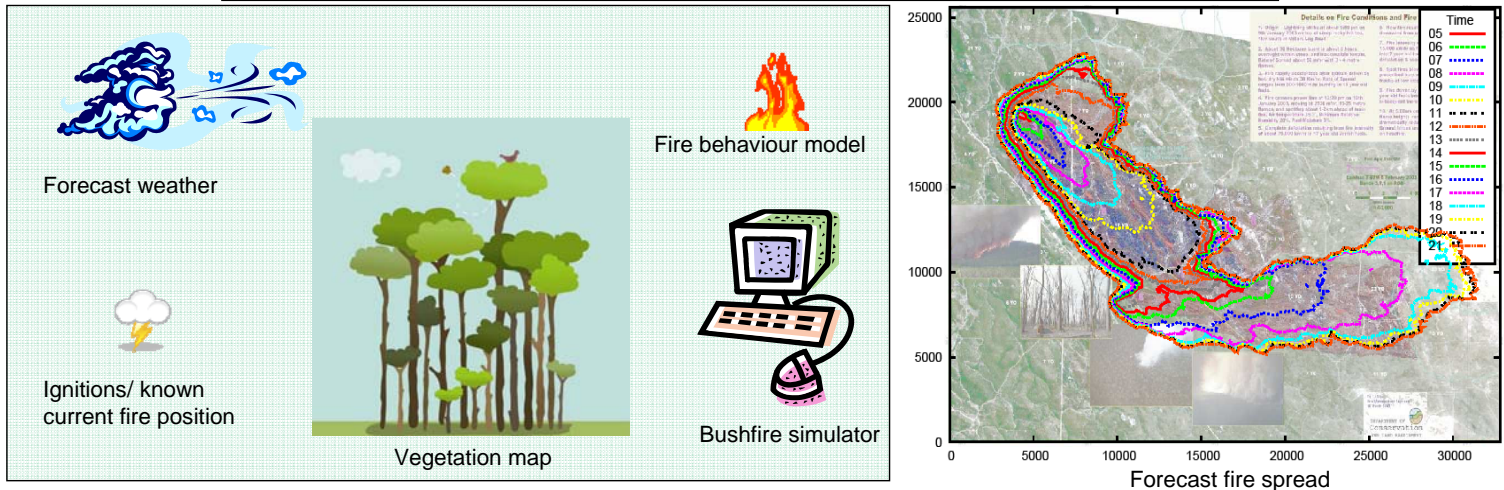


# Fire probability mapping using the Bushfire CRC fire spread simulator

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The standard simulation approach produces a single possible future scenario



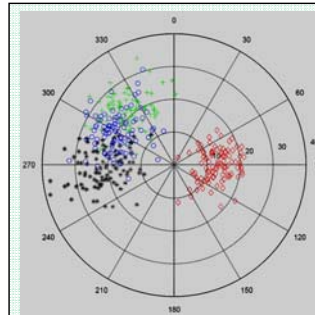
To plan for probable weather scenarios, perform multiple simulations

The weather forecast is the most likely weather. It is the mean of the distribution of potential weather.

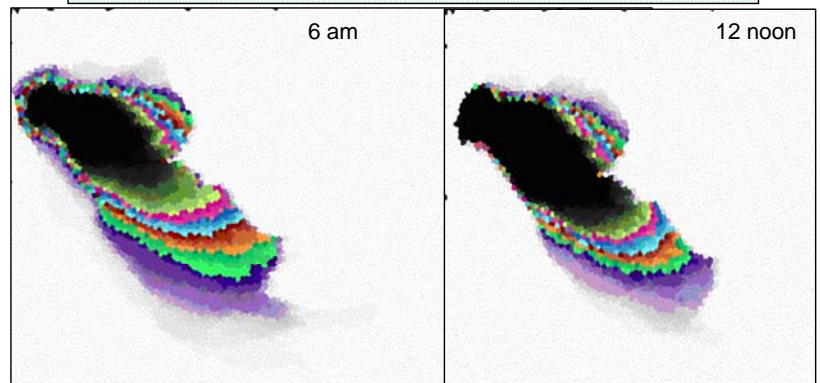


To determine the probability of fire spread:

1. Calculate the uncertainty of input weather (i.e. wind). The distribution of the wind is obtained from historical records for the nearest weather station.
2. Select a large number of weather scenarios from this distribution. We add values randomly selected from the weather distribution to the forecast winds. Note that uncertainty in the forecast increases with time into the future.
3. Perform fire spread simulations for each weather scenario (standard simulation above). NOTE: High speed simulator is required for this step.
4. Aggregate the results: The probability of burning = (number of simulations where cell is burnt)/(total number of simulations)



At 6 am, generate a large number of wind speed and direction forecasts for 9 am (red), 12 noon (green), 3 pm (blue) and 6 pm (black). The uncertainty in the wind speed forecast increases with time into the future



Fire spread probability forecast at 6am and 12 noon, black=100% probability, blue=50%, white=0%. There is less variation in the later-forecast due to the greater certainty in forecast weather. Note also that spotting was not included in the simulations, so the fire probability was under-estimated.