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The Unusual Meteorology of the Layman Prescribed Burn

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The Layman fuel reduction burn was planned as a low intensity, slow spreading fire with the aim of reducing fuel loads and benefiting the local ecosystem. The intense fire behaviour and deep convection column that developed was never anticipated in the prevailing environmental conditions. The burn was ignited in benign weather conditions in scenic southwest Western Australia in mid-October 2010. Late morning on the day following ignition, fire activity escalated rapidly; a convection column developed with a deep vertical circulation that extended through the lower part of the atmosphere. The ensuing intense crown fire and high flames burnt outside the intended boundary, resulting in home evacuations and causing extensive crown scorch.

The observations and meteorological model data indicate that the intense fire activity was driven by a combination of meteorological processes not routinely assessed in fire environments. Low level sea breeze convergence in the wind field, combined with potential instability in the presence of FireCAPE, entrainment of dry air from aloft desiccating already climatologically dry fuels and vertical circulation on a frontal change were all present. The dramatic development of the Layman burn provides an example of how weather elements not currently embedded in fire science may combine to produce an environment conducive to intense, unexpected fire activity.

Including three dimensional and time evolving meteorological information into assessments of fire weather conditions is essential to accurately anticipating likely fire behaviour. However, operational implementation is a non-trivial proposition due to the complexity of the processes and the limited relevant research. Fire managers, forecasters and researchers must work towards developing innovative meteorological products in order to mitigate against the impacts of events such as the Layman fire in the future.

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