# Why fly? Testing the efficiency of aerial firefighting operations

## RESEARCH TEAM

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Project duration: 18 months

## SUPPORTING ORGANISATIONS

National Aerial Firefighting Centre (NAFC)
National Council for Emergency Services (AFAC)
NSW Rural Fire Service (RFS)
Queensland Fire and Emergency Service (QFES)
National Emergency Management Agency (NEMA)
WA Department of Fire and Emergency Services (DFES)
Emergency Management Victoria (EMV)

## Background

Aerial firefighting is a high profile and cost component of bushfire management, however little is known about the conditions under which it is used and under which it is effective. While aerial suppression has been shown to be very effective at limiting fire growth in the early stages (initial attack), knowledge about its effectiveness on larger fires is lacking. Many Australian bushfire inquiries have recommended research to fill this gap.

The effectiveness of aerial suppression is a complex problem. Many types of aircraft can drop a variety of products in a range of tactics. Aerial suppression drops can have a variety of objectives, such as stopping the spread of initiating fires, protecting properties, quenching spot fires (small fires ahead of the main front) or slowing a large fire front. There can be many aircraft working on the same fire, sometimes in different parts of it and usually to support on-ground suppression efforts.

A wealth of data has been collected about fires and the conditions in which they occurred in. Recently data capturing the movement and actions of firefighting aircraft has become available. These data can be compiled to better understand the use and effectiveness of aircraft. For example, the figure shows two lines of retardant dropped immediately downwind of a fire soon after it was reported.

## Project description

Following a review of relevant research methodologies, this project will use data collected in recent years from several Australian states to:

- assess the availability and completeness of aircraft tracking data and make recommendations about improvements
- study the range of objectives for firefighting aircraft types
- complete aircraft use profiles that outline the roles and conditions that different aircraft types are currently used in across Australia
- prepare detailed case studies on aircraft use and effectiveness on selected fires, and
- compile a broader understanding of aerial suppression effectiveness based on objectives.

## Intended outcomes

The analyses from this project will form a knowledge base for justification of resource use, future funding requests and improved operational decisions. These include decisions about which aircraft to dispatch and which mix of aircraft to invest in. With better information, there is potential to improve fire suppression outcomes, which will ultimately make communities safer, save lives and protect more community values.

These improvements will also lead to significant economic savings and may also reduce aircrews' exposure to potential accidents.

The project outputs will also provide guidance for improvement of reporting and dispatching tools such as ARENA and Resource to Risk, and will enable improvements in training material.

## Translation and implementation potential

The outputs will be published in a final project report and scientific papers, and will be presented at conferences and research forums. The results will be available to firefighters and researchers worldwide.

In addition, the findings will be suitable for incorporation into training material and decision support tools such as ARENA and the project reports will be a valuable resource for supporting future business cases for funding aerial suppression.

## Further information

For full project details head to: https://www.naturalhazards.com.au/research/research-projects/why-fly-how-do-we-know-aerial-firefighting-operations-are-effective-and

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