

Bushfire Spatial Data Models and Ignition Data Project



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INTEGRATION OF BUSHFIRE AND PLANNED BURN IGNITION AND FIRE HISTORY DATASETS

INTRODUCTION

Bushfire ignition and fire perimeter data collected by different fire agencies vary in spatial and temporal scales, and by recorded attributes. Discrepancies within and between datasets limits the ability and ease to which statewide analysis and reporting of fire incidents can occur. This project aims to address this by identifying underlying issues regarding the compatibility of similar datasets, and data quality issues in the Department of Environment, Land, Water and Planning (DELWP) and the Country Fire Authority (CFA) fire ignition and fire history datasets.

AIM

The aim of this project is to, systematically assess the quality and integrate four spatial GIS datasets together.

DATA

The four datasets acquired and analysed are:

1. DELWP bushfire ignitions point dataset (1972 and 2014).
2. DELWP planned burn ignitions point dataset (2001 to 2014).
3. DELWP fire perimeters polygon dataset (1903 to 2014. This layer represents bushfires and planned burns that have occurred or impacted in Victoria).
4. CFA Fire Incident Reporting System (FIRS) dataset of bushfire ignition points (1990 to 2014).

METHODS AND KEY RESULTS

Figure 1 provides an overview of the 6 stages of identifying data redundancy, data duplication and linking the DELWP and CFA datasets. A number of data standardisation techniques and selection criteria were used to objectively identify:

- Erroneous records
- Duplicates
- Linkages between these two datasets were based on: 'Date/time' (with a 12 hr time difference threshold between the two datasets), 'lat/long' (both ignition points are within 10 km within each other) and 'cause of ignition'.

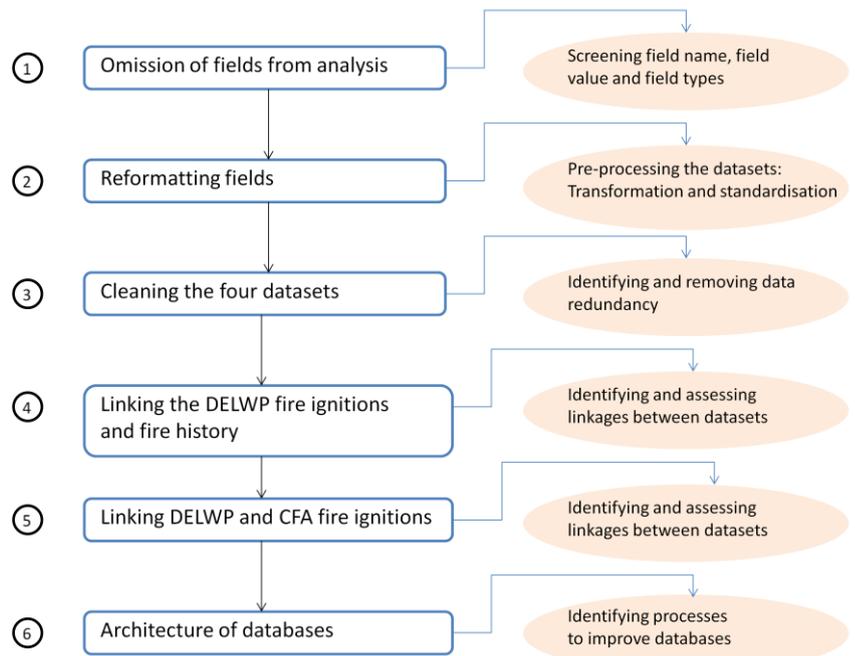


Figure 1. Overall study design and processes of identifying errors within each database and merging them together.

Data quality findings

- ✓ **4.4%** of the DELWP bushfire ignitions dataset were redundant.
- ✓ **7.5%** of the DELWP planned burn ignition dataset were redundant due to missing ignition date records and incorrect fire season attributes.
- ✓ **38.1%** of the DELWP fire perimeter polygon dataset contained missing or incorrect information regarding the date stamps on the fires. However, between 2006 and 2014, this figure reduced to **7.0%**. Data duplications accounted for **3.0%** of the dataset.
- ✓ **0.9%** of the CFA dataset were redundant.

Joining the DELWP fire ignition and the DELWP fire history datasets:

The success rate of matching the DELWP bushfire ignitions to the fire perimeter polygons dataset was 74.9%, whereas for prescribed burn ignitions, the success rate was 43.8%.

Joining the DELWP and the CFA fire ignition databases

The success rate varied between 0.0% and 41.9% depending on the 'cause of ignition' factor.

The average distance of the fire ignitions corresponding to the boundary of its fire polygon for the DELWP and the CFA ignition data were 1524.7 m and 4560.0 m, respectively.

CONCLUSION

Some recommendations include:

- Ensure that fire agencies adhere to data requirements via stringent quality control processes at all levels (i.e. from data entry to reporting).
- Define minimum attribution for bushfire datasets for interagency collaboration and data sharing.
- Adopt and maintain a normalised bushfire design between fire agencies by adhering to the same database field design and incident reporting requirements.

