

FIGHTING *fire with GIS*

Geoscience Australia helps Victorian firefighters battle blazes

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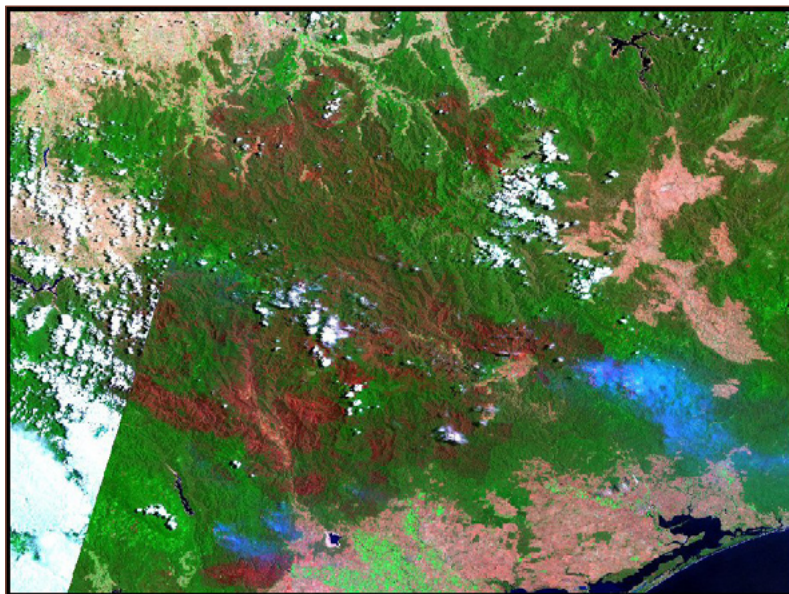


Figure 1. Landsat satellite image showing the extent of burnt areas in eastern Victoria at 3 January 2007.

Every summer, bushfires are a fact of Australian life. Recent fires in eastern Australia have devastated communities and infrastructure, and destroyed vast areas of bushland. The greatest impact was in Victoria, and in large tracts of New South Wales and South Australia.

In early December 2006, Victoria experienced summer thunderstorms that started many fires in the east and north of the state. By 11 December, around 4000 firefighters had been deployed to fight 13 blazes. A major fire in northeast Victoria had already burned 250 000 hectares of bushland and destroyed several buildings, including the famous Craig's Hut which featured in the iconic Australian movie *The Man from Snowy River* (figure 1). By 18 December, 18 houses had been lost in Gippsland, and a man had died after falling from a trailer while fighting fires.

Key Geoscience Australia role

Because of these and other bushfires, Emergency Management Australia (EMA) invoked the Commonwealth Disaster Plan, which provides a framework for the Australian Government to assist state and territory government agencies when resources are limited.

EMA asked Geoscience Australia to provide GIS mapping experts to work in conjunction with the Victorian Country Fire Authority and the state's Department of Sustainability and Environment.

Staff with relevant expertise from Geoscience Australia volunteered to help and committed to work during the Christmas – New Year period. They worked in two 12-hour shifts per day at either the Incident Command Centre in Benalla or at the Integrated Fire Agency Coordination Centre in Traralgon.

Local incident management commanders and section commanders needed maps to plan the strategic placement of strike teams and some 35 aircraft fighting the fires. The GIS officer on duty had to update and maintain data on strategic control lines, containment lines, incident management team (IMT) boundaries and the fire area (derived using remote sensing).

Geoscience Australia staff at the Traralgon centre worked IMTs to identify and establish new fire control lines. They constantly updated and maintained strategic control

lines, containment lines and IMT boundaries. Fire activity updates arrived in many forms: handwritten notations on topographic maps, GPS coordinates and, occasionally, GIS-compatible files from other IMT mapping teams. These data were updated, sent to IMTs and published as paper maps (figure 2).

Liaison the key

The team liaised with the incident controller to determine the location of consolidated control lines and to prepare for further burning-off operations when weather and fuel moisture permitted. Team members also contacted mapping staff in the Emergency Coordination Centre in Melbourne. Mapping experts at the centre received raw line-scan data and airborne multirole solid state active array radar (AMSAR) data flown just hours before, which needed to be orthorectified and then digitised.

During the assignment, Geoscience Australia staff developed a method to show fire areas, containment lines, strategic control lines, fire station locations, IMT boundaries and sector areas in a 3D visual environment. Daily briefings at the Integrated Fire Agency Coordination Centre in Traralgon included 3D presentations derived from this innovation. The briefings gave decision makers a better understanding of the terrain in which they were deploying strike teams.



Figure 2. Geoscience Australia volunteers contributed to the emergency response through regular updating of fire-growth maps overlain on Landsat satellite imagery.

Fire growth in real time

Fire-growth presentations to the meetings demonstrated a methodology that showed the growth of the fire over several days using images exported from specialised GIS software and loaded into a PowerPoint presentation. The converted GIS files were also loaded onto laptop computers so that decision makers could easily view and interrogate areas of interest using 3D functionality.

After the successful initial demonstration, staff prepared a similar presentation for a Victorian Cabinet meeting on 22 January 2007.

The collaboration of Victorian and Australian government agencies produced invaluable support during a difficult and resource-intensive time for emergency managers. This work demonstrated that these agencies can work together effectively to share expertise and data.

For more information

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Related websites

ACRES imagery of Victorian bushfires
www.ga.gov.au/acres/whatnew.jsp#firejan