Remote sensing and spatial analysis for fire management

Remote Sensing and Spatial Analysis

Project Core Team

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Project Team	granted
Program Leader	granted
Directorate	granted

Remote sensing and spatial analysis for fire management

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Context

The focus of the Remote sensing and spatial analysis for fire management function is research related to fire management, monitoring and reporting and associated operational requirements. Monitoring and reporting is underpinned by fire scar mapping.

The imagery used is predominantly satellite imagery but also includes optical and thermal imagery from airborne platforms. Research areas include historical mapping which utilise the extensive archive record of satellite imagery and occasionally aerial imagery to build a fire history (or fuel age) for a location or to reconstruct the spread for major bush fire. This activity also include monthly mapping during the prescribed burn season. The function also plays a key role in fire research and development. This includes research into fuel growth, fire spread and fire risk models. Internal and collaborative projects are carried out to further streamline and automate mapping techniques. General imagery support is also provided to Fire Management Services Branch. This includes roles such as incident mapping and predictions as required and advice in imagery and systems development.

Aims

- Improve processes of fire scar identification to enable historical fire regimes to be understood for safety and ecological applications.
- Improve burn security through the development of methodology to detect and communicate post-burn hotspot locations.
- Develop techniques to provide inputs for fire behaviour models to enable desktop assessments.
- Provide remotely-sensed spatial and temporal data streams to assist with bushfire investigations and reporting.

Progress

- Continued development of remote piloted aircraft obtained spinifex cover field data and Landsat imagery application for input to spinifex fire behaviour models. Results presented at UAS4Enviro2018 conference.
- Fire scar information for the Pilbara region and Kanyirninpa Jukurrpa supplied on a monthly and annual basis to inform and report on prescribed burning and fire suppression activities in the Western Desert.
- Refinement of methodology for operational use of thermal camera to detect hotspots for burn security.
- Support Fire Management Branch with product to inform fire recovery, fire chronology and new satellite technology/availability.
- Fire risk model for Swan Region updated.
- Great Victoria Desert traditional and contemporary fire patterns project completed.

Management implications

- The information that Remote Sensing and Spatial Analysis provides for fire management is designed to significantly increasing the accuracy of reporting and decreasing the risks of fire management activities.
- Delivering fire scar mapping and information allows practitioners to make informed decisions which leads to more efficient fuel reduction activities and successful completion of burn prescriptions.
- Developments in remotely piloted vehicle application together with satellite imagery will enable fire managers to more efficiently and accurately map fuel characteristics at a range of scales, greatly enhancing their ability to forecast fire danger and to predict fire behaviour without having to carry out costly ground-based field measurements.
- Through the availability and use of fire scar information in the Pilbara the application and requirement for fire scar information has grown. Consistent production and attribution of monthly fire scar mapping has

resulted in the compilation of an annual fire scar mapping product with improved date, area and cause attribution.

- Security of burns is improved by the delivery of thermal imagery hotspots to on-ground staff.
- Updates to the Swan Region Fire Risk Model informs prescribed burn planning.

Future directions

- Continued development and automation of fire scar detection methodology.
- Investigation and development of new data sources including new satellite data and aerial capture.
- Implementation and development of the spatial analysis of fire patterns and fuel loads.