LandFor FOR LAND MANAGEMENT

Using satellite time series data to map forest disturbance and support land management activities

Opportunity

Land management agencies have to fulfil forest reporting objectives at a state, national and international level. The Department of Environment, Land, Water and Planning, or DELWP, has built Australia's only state level public land based forest inventory via the Victorian Forest Monitoring Program (VFMP). Initiated in 2010, the VFMP provides baseline data for long term trend detection and prediction of future changes, supporting statutory reporting obligations as well as forest policy and management decisions, and Victoria's performance towards sustainable forest management. It includes three tiers of data collection: ground plot information, aerial imagery, and satellite imagery. Ground and photo plots, which represent less than 1% of the public forest estate, are revisited every 5 years; while satellite imagery is used to support estimation processes.
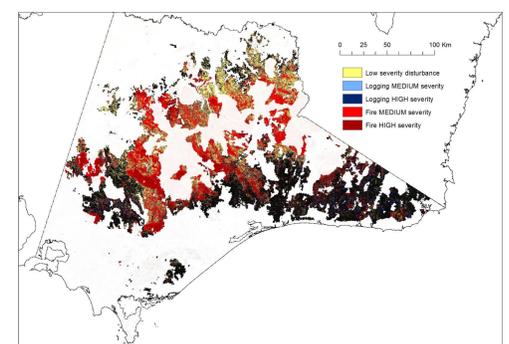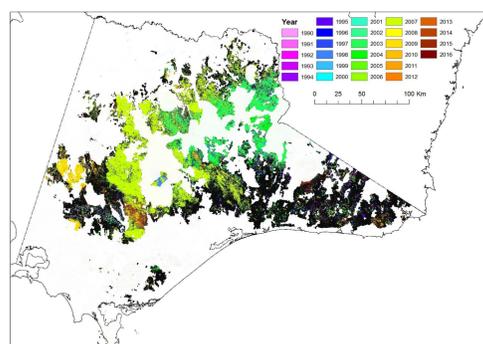
Partners

RMIT research team

Simon Jones,
Professr, Geospatial
Science

Mariela Soto-
Berelov, Lecturer,
Geospatial Science

State-wide Forest disturbance maps

Approach

The Landsat image archive was mined to create annual composites over three decades. An extensive reference dataset was created through a multiple lines of evidence approach, in which trained interpreters virtually validated 10,000 reference points. Whenever a disturbance was detected, the interpreter would attribute the type of disturbance, such as logging, fire, disease or drought, severity and timing.
Using machine learning, the reference dataset was trained and tested to create large area disturbance maps according to date and agent of disturbance.
RMIT's research team worked with DELWP and the European Forest Institute throughout to ensure the project outcomes met end user needs.

Impact and outcomes

DELWP uses LandFor outputs to support efficient statutory forest monitoring and reporting activities and decision making in the land management and policy areas. LandFor makes use of present day open data policies, improved computer and processing capabilities to create –for the first time in Australia- large area disturbance and recovery maps. These enable the assessment of previous interventions, helping to quantify and understand the annual impacts of land management forest and human and natural processes.

RMIT
UNIVERSITY