Advancing grass fuel condition monitoring with multi-sensor satellite data

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Remote sensing of grass fuel condition

Better grass fuel data. Better fire danger ratings. Better outcomes for communities. This project develops a standardised, nationally scalable satellite-based approach for reporting grass fuel condition across Australia, integrating multi-sensor data to strengthen the inputs that operational systems depend on.

Background

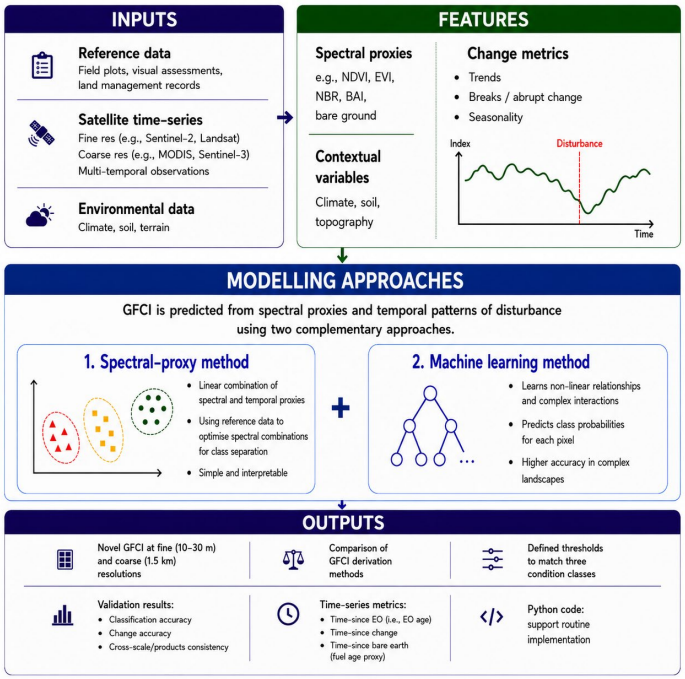
Grass fuel condition strongly influences grass and crop fire behaviour and is **a key input for operational systems** such as the Australian Fire Danger Rating System (AFDRS) and the Spark wildfire simulation toolkit. Current operational mapping classifies grass fuel condition into **three broad classes**: (i) *natural/unharvested*, (ii) *grazed/harvested*, and (iii) *eaten out/harvested & baled*. However, these classes are **often derived from limited and inconsistent data**, with little capacity to systematically detect harvest or grazing changes across large areas. Grass fuel condition means different things to different users, precise structural metrics are difficult to retrieve from satellite data, and reference data are scarce. New methods are needed that push the boundaries of what earth observations can deliver while serving both today's and tomorrow's fire models.

New Grass Fuel Condition Index (GFCI)

- **A satellite-derived continuous index** representing grass fuel condition
- **Transformable** into three conventional condition classes using calibrated thresholds
- **Transferable** across spatial and temporal (weekly, monthly) scales
- Expected to **correlate with grass fuel load, height, and continuity**
- Designed to **distinguish disturbance-driven changes from curing/phenology**

(Images: AFDRS Grass Fuel State Fact Sheet)

Methodology



Next steps

- **Reference data curation** and harmonisation for model training and validation
- **Pilot implementation** and evaluation of the proposed framework
- **Evaluation of scalability and transferability** across case studies

How can you help?

Do you know of any existing relevant reference datasets (for example, field observations, grazing/harvesting records etc.) that could support this project? Please drop us a line.

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For additional information scan the QR code or contact:
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