



Forest
Research
Institute

NOBURN: Bushfire research through citizen science

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NOBURN

- **NatiOnal BUshfire Resilience Network**
- A multi-disciplinary and citizen science research project
- Funded by Commonwealth Department of Industry, Science and Resources
- A collaboration between UniSC, Noosa Shire Council and the University of Adelaide – Australian Institute for Machine Learning
- Ends April 2025



**Australian
Institute
for Machine
Learning**



NOBURN

Aims of our research:

1. Getting community involved in the data collection and mapping of forest fuels
2. Predict severity, probability and burn area of potential bushfires
3. Built community resilience and increase awareness on risks associated with forests and fuels

NOBURN app – Download now





noburn

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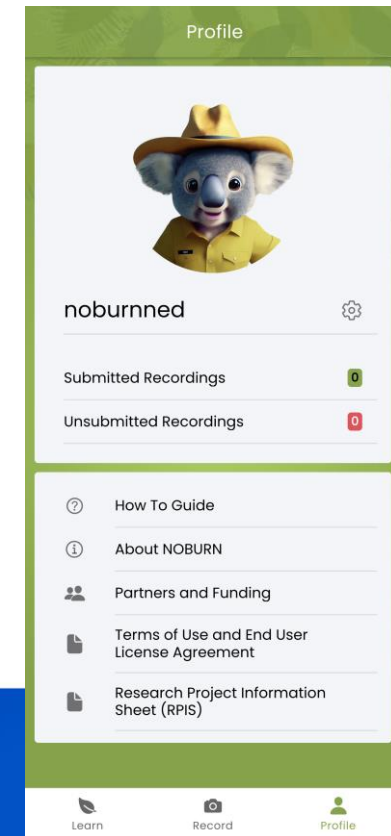
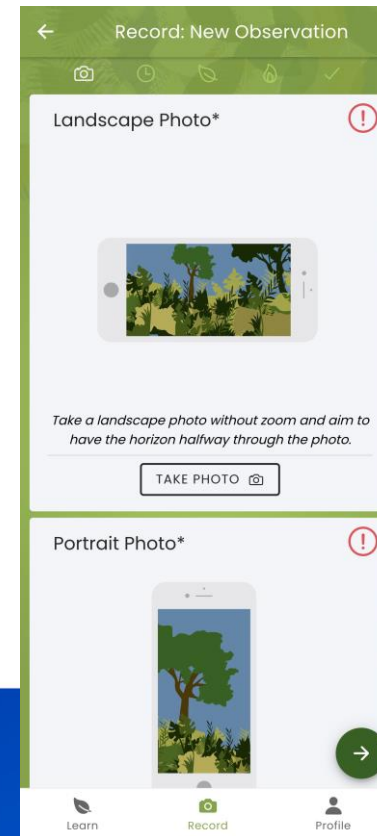
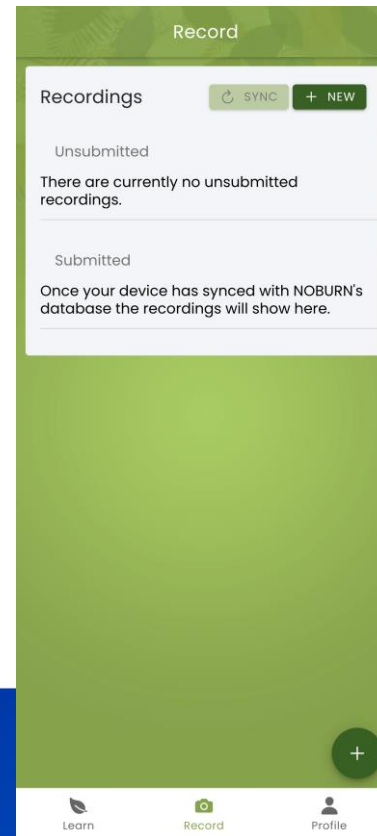
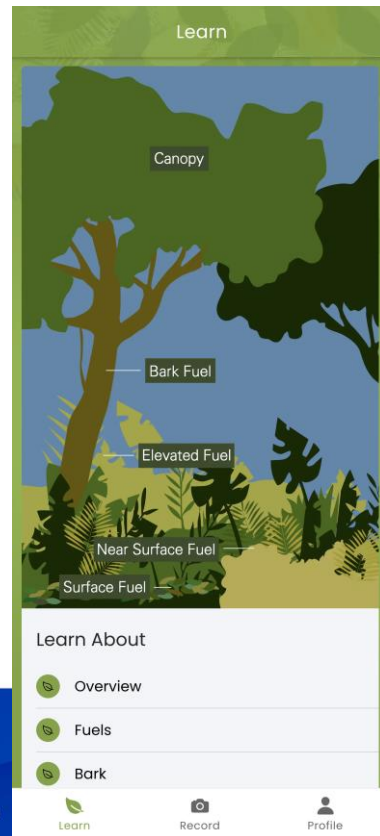
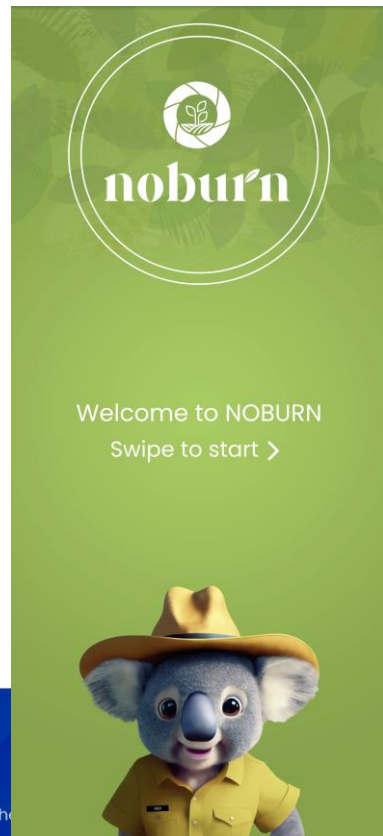
Snap a pic, help predict!

Become a NOBURN Citizen Scientist, and learn more about our forests and help us predict bushfires.

Simply by downloading the NOBURN app on your smartphone, you can record evidence of the fire-susceptibility of our forest and help us learn more about what is driving bushfires. You'll become an active participant in our research and together, we can improve our readiness and resilience.

NOBURN app

- Data collection tool
- Designed and developed by the research team



Overall fuel hazard assessment guide

4th edition July 2010

Fire and adaptive management

report no. 82



Appendix 2. Sample fuel assessment field work form

Date Assessed:	Assessors:
Sampling Location:	Veg Type:

Plot Information												
Plot No.												
Zone:												
Easting (GDA94 MGA UTM):												
Northing (GDA94 MGA UTM):												

Canopy (20m radius)												
Canopy Ave Height to Top:												
Canopy Ave Height to Base:												

Bark fuel (20m radius)															
Stringybark Fuel Hazard:	NP	M	H	VH	E	NP	M	H	VH	E	NP	M	H	VH	E
Ribbon Bark Fuel Hazard:	NP	M	H	VH	E	NP	M	H	VH	E	NP	M	H	VH	E
Other Bark Fuel Hazard:	L	M	H	VH	E	L	M	H	VH	E	L	M	H	VH	E

Note: NP is bark type not present. Use the highest bark hazard rating to determine Overall Fuel Hazard.

Elevated fuel layer (10m radius)															
Elevated % Cover:															
Elevated % Dead:															
Elevated Fuel Ave Height (m):															
Elevated Fuel Hazard:	L	M	H	VH	E	L	M	H	VH	E	L	M	H	VH	E

Near-surface fuel layer (10m radius)															
Near-surface % Cover:															
Near-surface % Dead:															
NS Ave Height (cm):															
NS Fuel Hazard:	L	M	H	VH	E	L	M	H	VH	E	L	M	H	VH	E

Surface fuel layer (10m radius)															
Surface Litter % Cover:															
Ave Litter Depth (mm):															
Surface Fuel Hazard:	L	M	H	VH	E	L	M	H	VH	E	L	M	H	VH	E

Combined Surface and Near-surface Fine Fuel Hazard calculation (refer Section 7)															
Combined Hazard:	L	M	H	VH	E	L	M	H	VH	E	L	M	H	VH	E

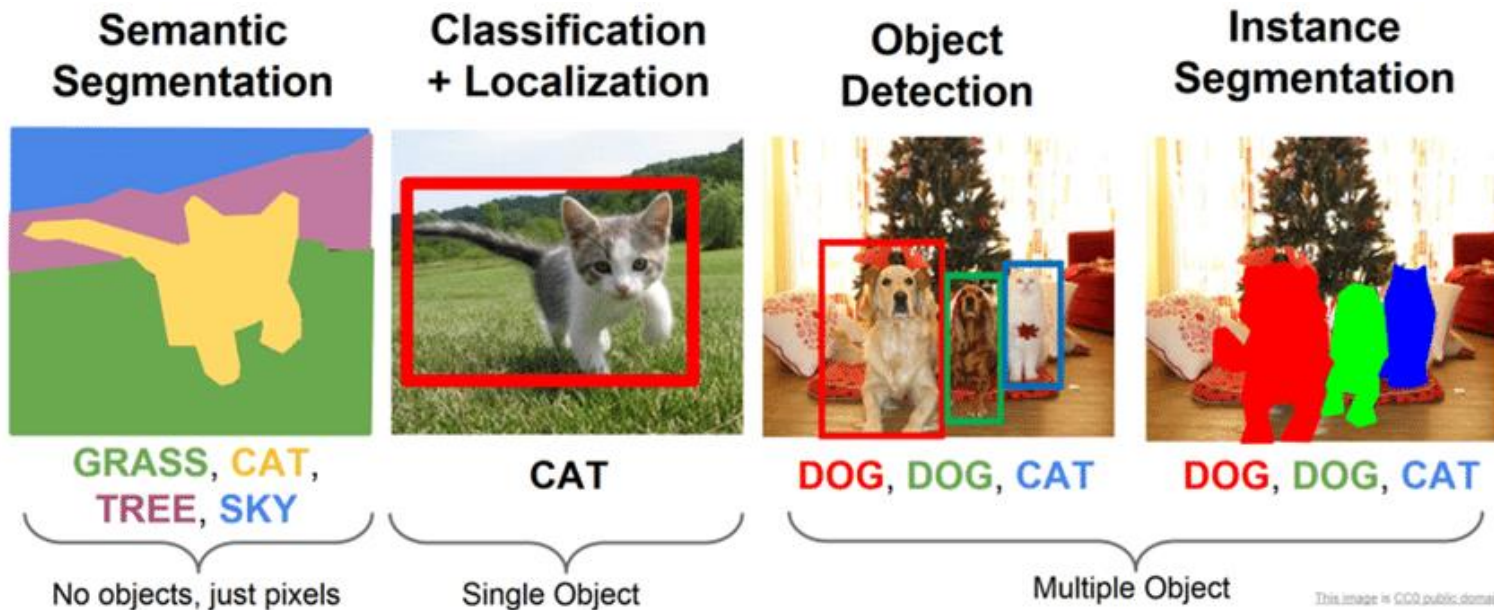
Overall Fuel Hazard calculation (refer Section 8)															
Overall Fuel Hazard:	L	M	H	VH	E	L	M	H	VH	E	L	M	H	VH	E

Are the plots representative of the average fuels across the sampling location?	Yes	No
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If no, explain any significant difference between plots. For example, wet gully runs through the sampling area, no plots were located in this gully.

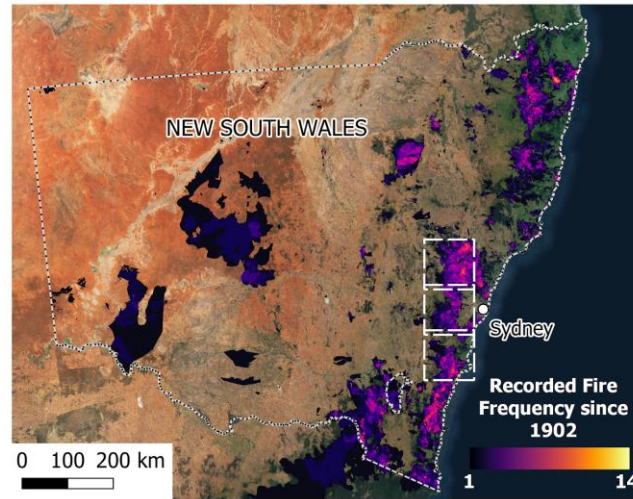
NOBURN using Machine Learning

- Automating overall fuel hazard
- Automating hazard rating of fuel types

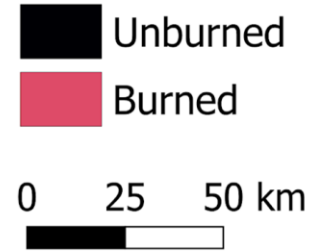


NOBURN using Machine Learning

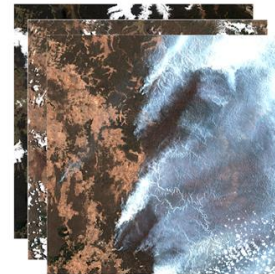
- Area of interest
- Historic fire events
- Predictors:
 - elevation
 - Sentinel composite
 - climate data
 - Fire frequency
- Ignition points



Gospers Mountain
(25 Oct 2019 - 9 Feb 2020)



Sentinel-2 time-series

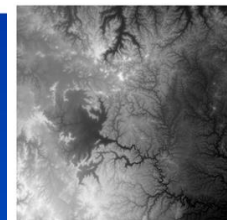


Sentinel-2 composite

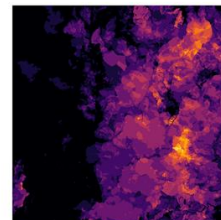


Maximum
NDVI →

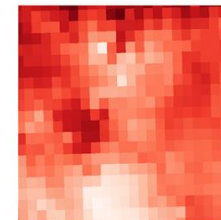
Elevation



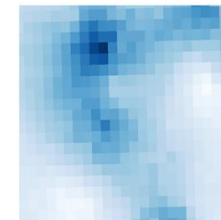
Fire frequency



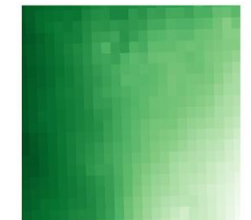
Temperature



Humidity

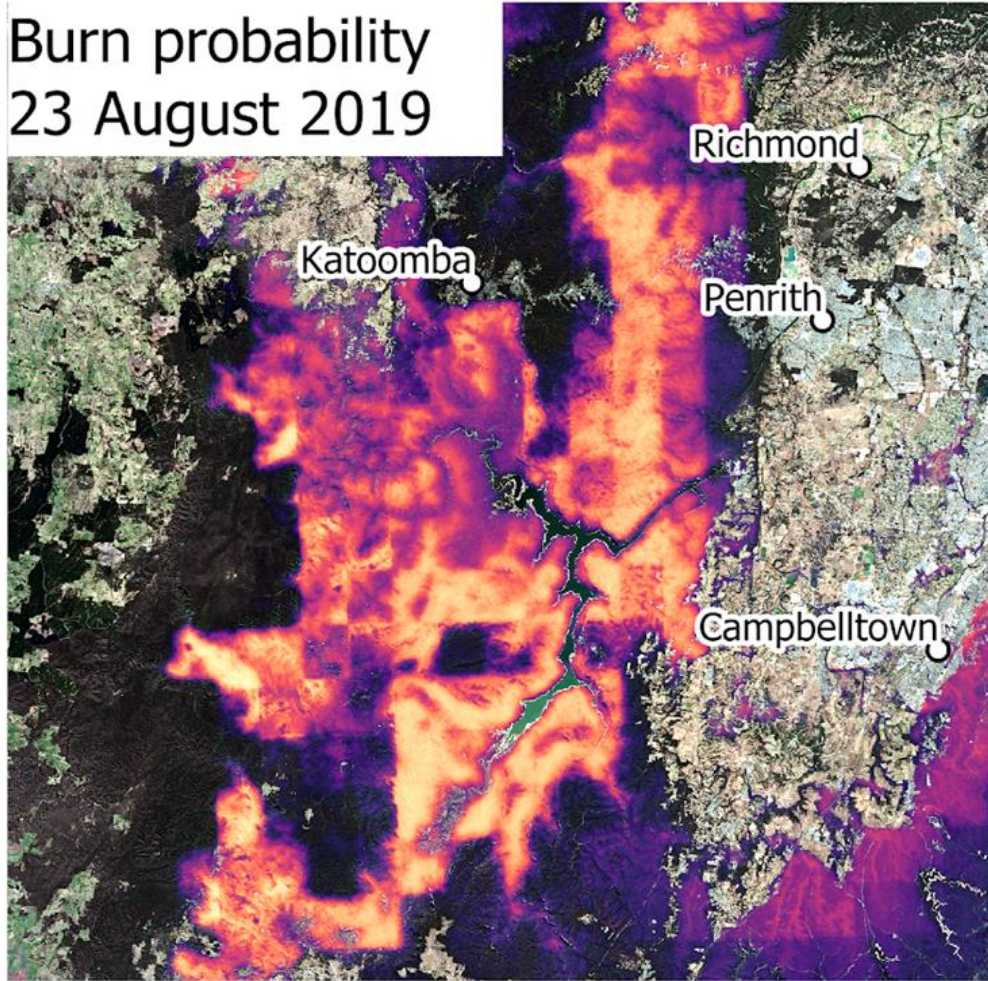


Evapotranspiration



NOBURN using Machine Learning - Probability

Burn probability
23 August 2019



Post-fire
20 March 2020

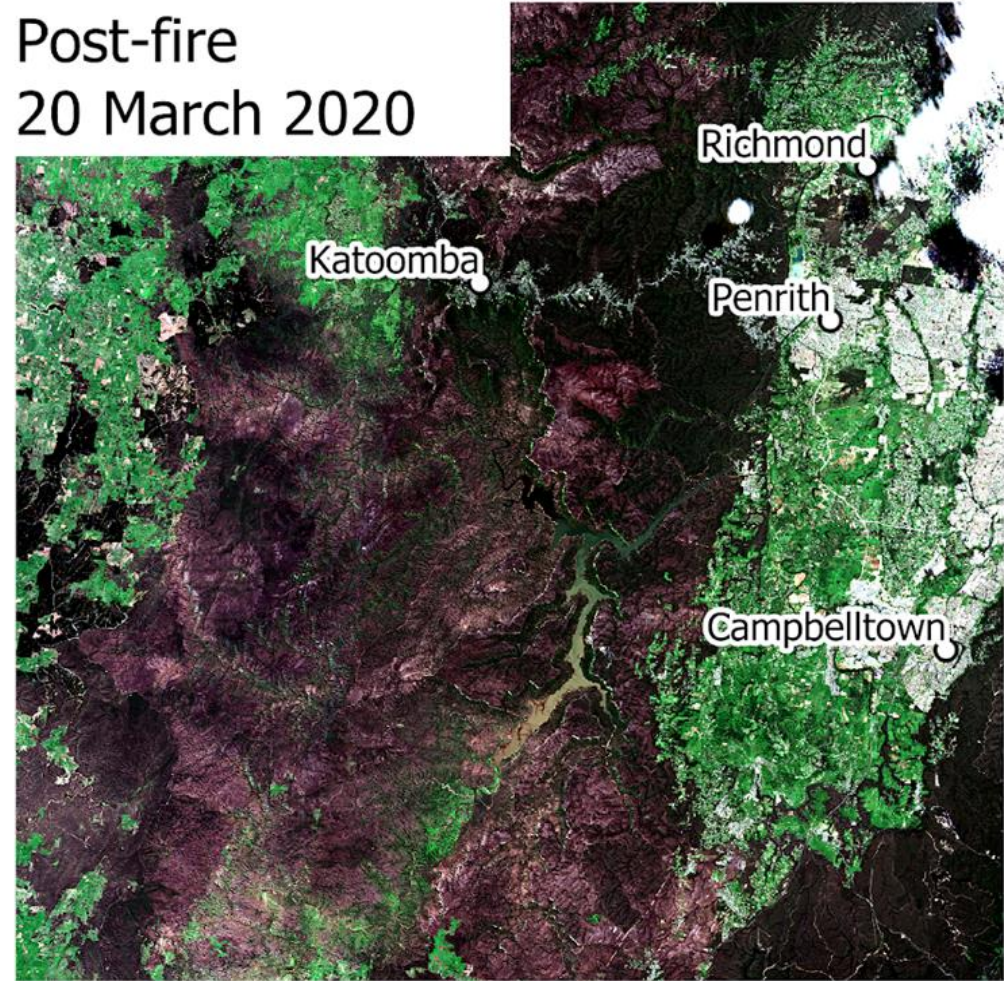


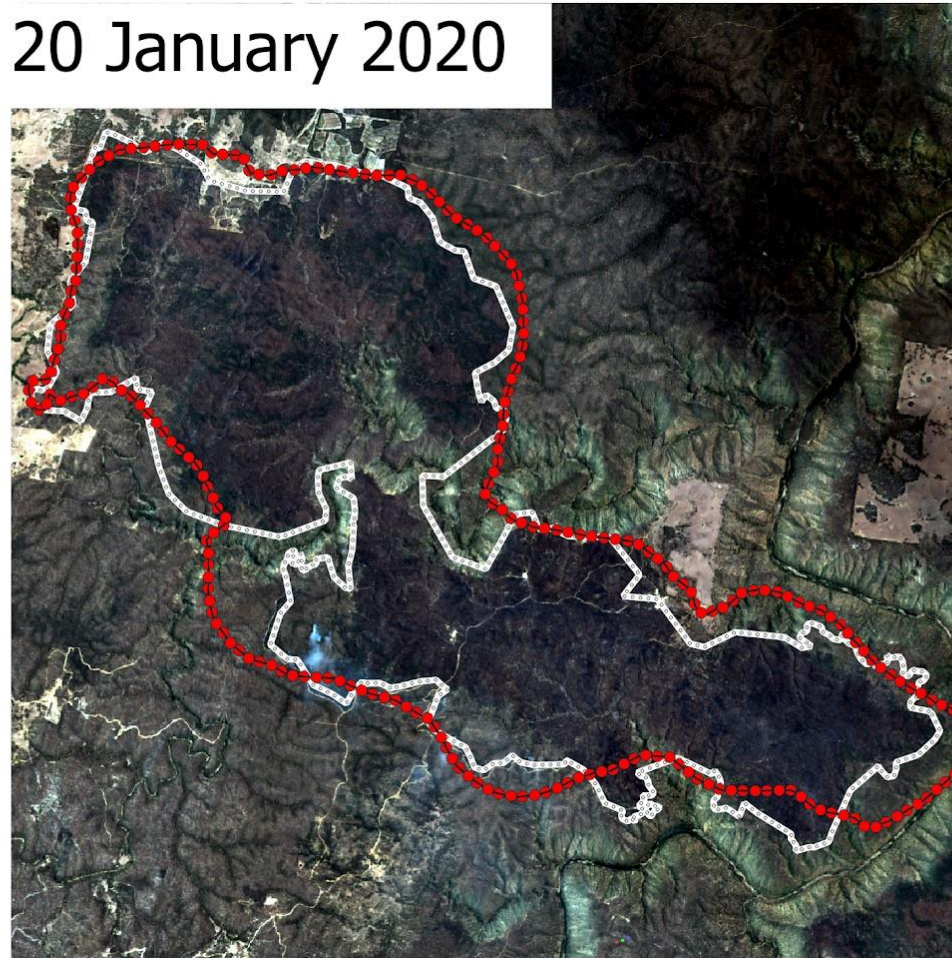
Image credit: contains modified Copernicus Sentinel-2 imagery

NOBURN using Machine Learning – Burn area



22 October 2019



20 January 2020



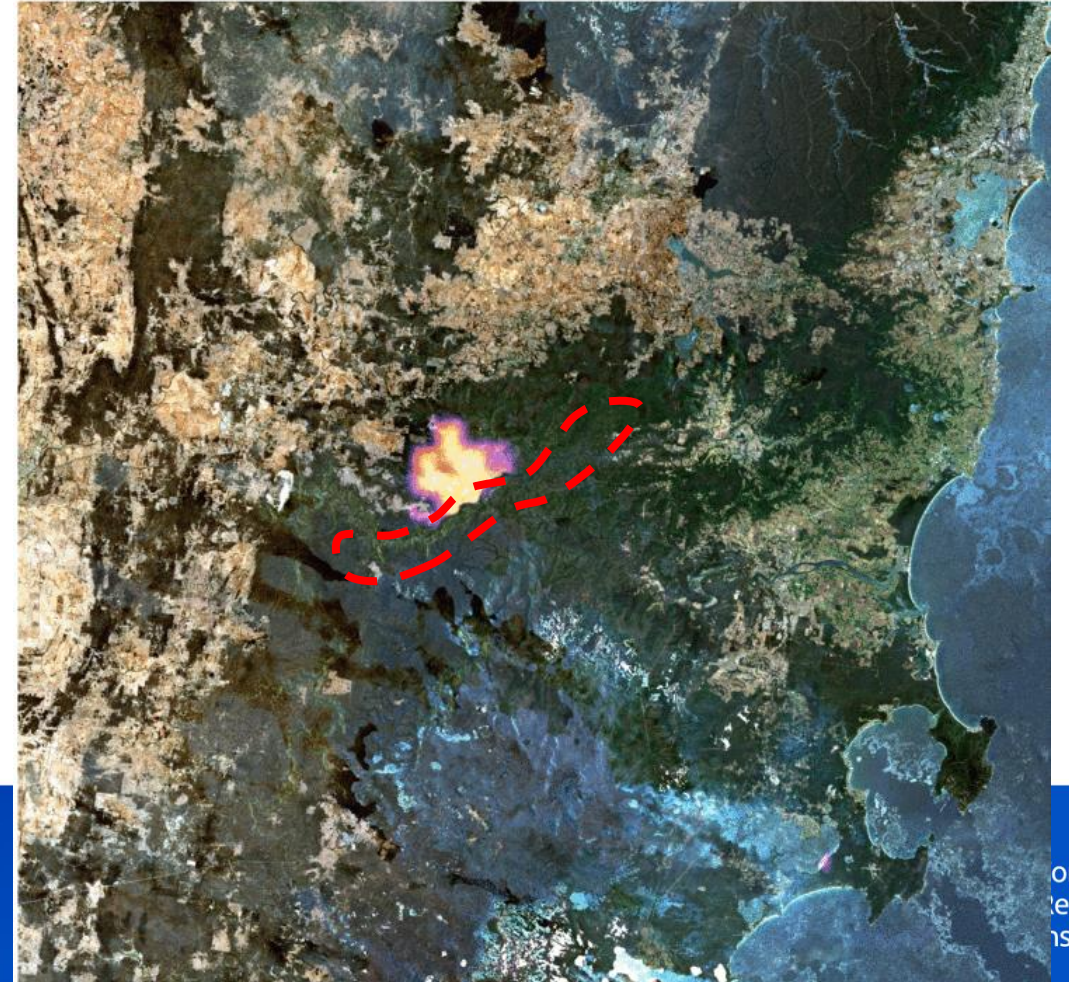
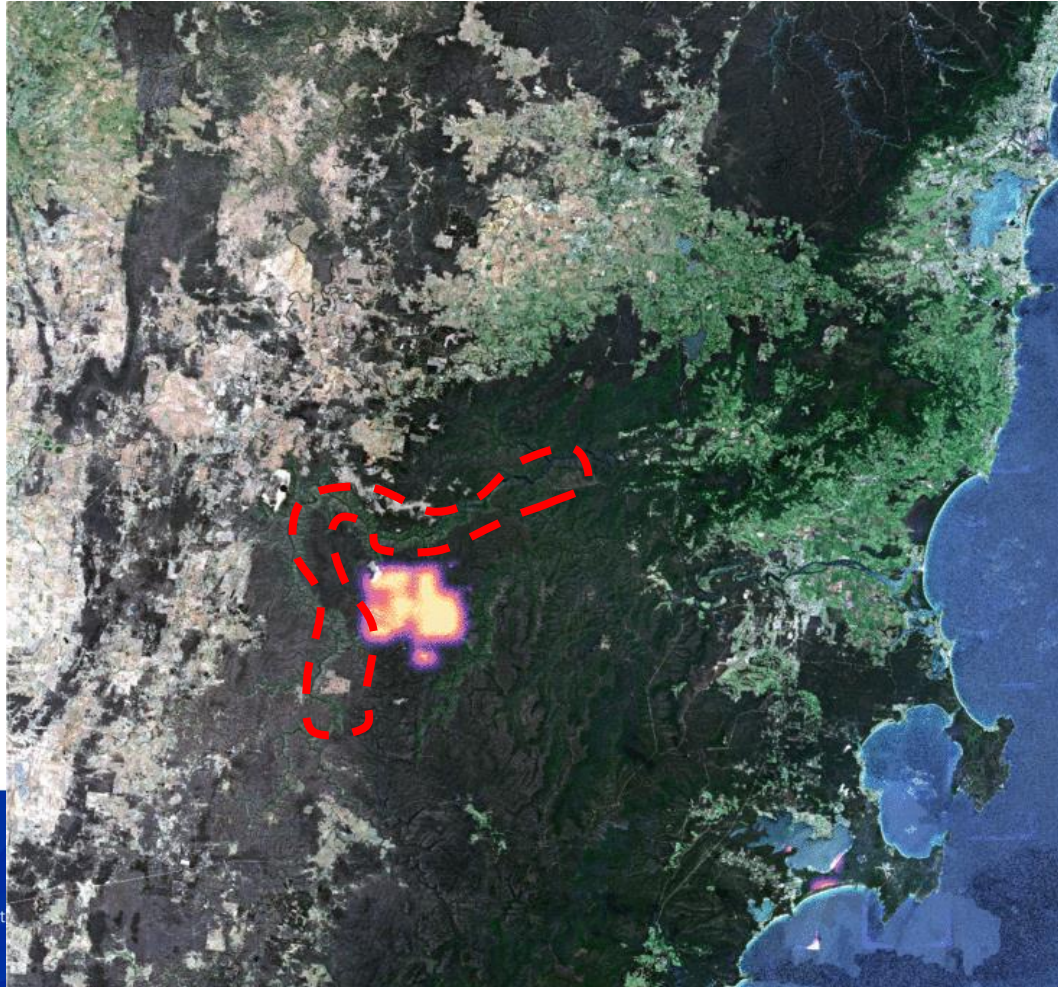
Jacqua Creek fire
(27 Dec 2019 -
26 Jan 2020)

-  Burned area (prediction)
-  Burned area (ground truth)

0 1 2 km



NOBURN using Machine Learning – Temporal prediction





Snap a pic, help predict!

Download the NOBURN app today.





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Thank you!