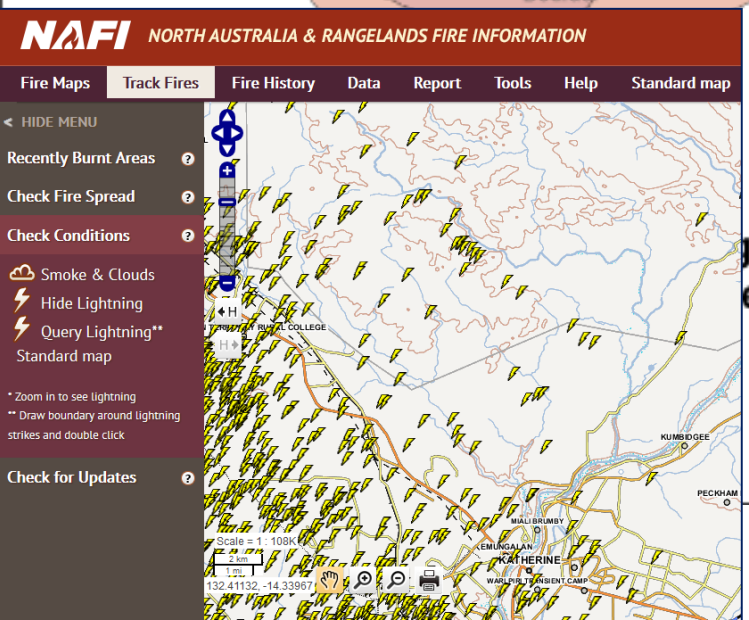
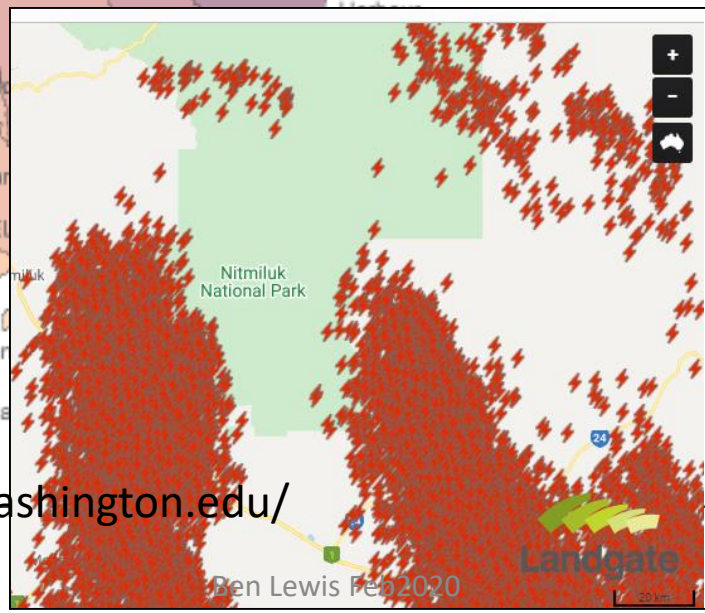
Lightning fire in the Top End

Ben Lewis

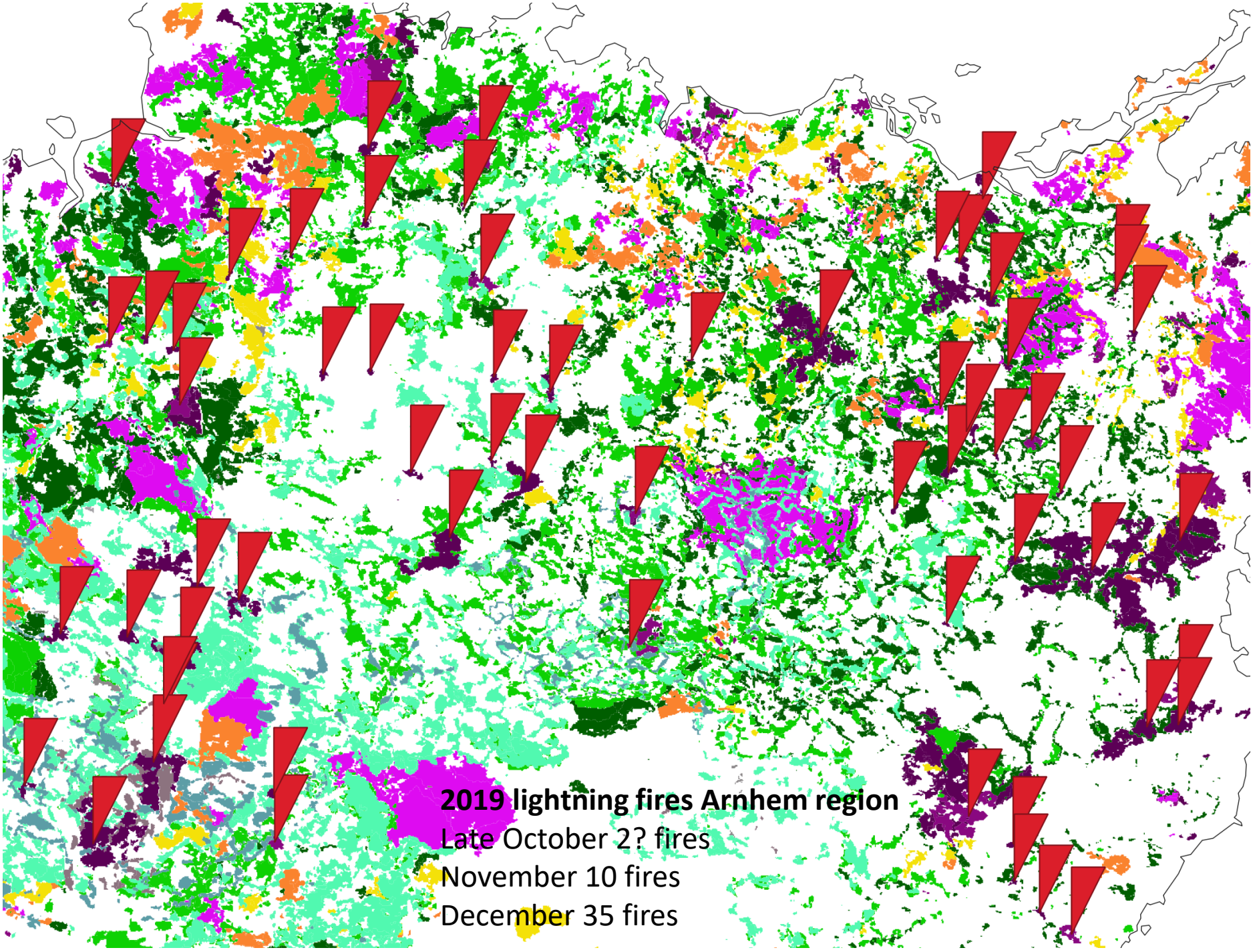
Australian Government
Bureau of Meteorology

lightning in TOP END NT	2 million
lightning that touches the ground	1 million
lands in fuel	0.5 million
catches fire	10000s?
does not get rained on	1000s
survives overnight	100s
gets mapped on Nafi	100





http://webflash.ess.washington.edu/


2019 lightning fires Arnhem region
Late October 2? fires
November 10 fires
December 35 fires

Lightning fire patterns

Regional patterns & timing

Starting west to east (both in Top End NT and broader north Australia)

October-December range. Peak in November

Some variability in timing of lightning fire year by year

What makes a bad lightning fire year

Longer wet -dry widow

Hot dry windy burst after first storms

Lots of fires in a short period

+ fuel condition/ landscape vulnerability

2019 lightning fires in Top End NT

Similar number to 2018 but much later

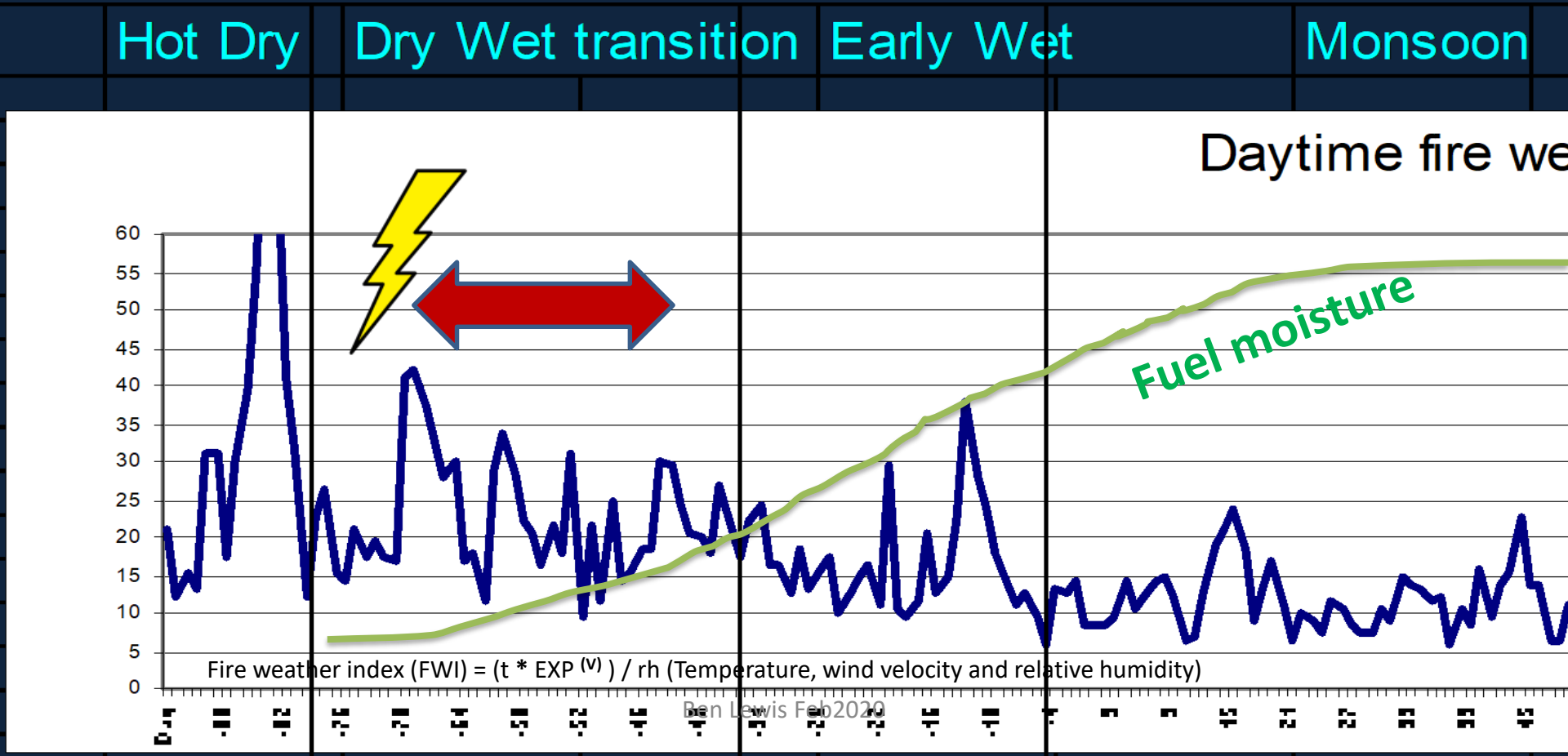
Mostly December

Many lightning fire were actively suppressed

High numbers of lightning fire 2018 and 2019 compared to 2016 & 2017

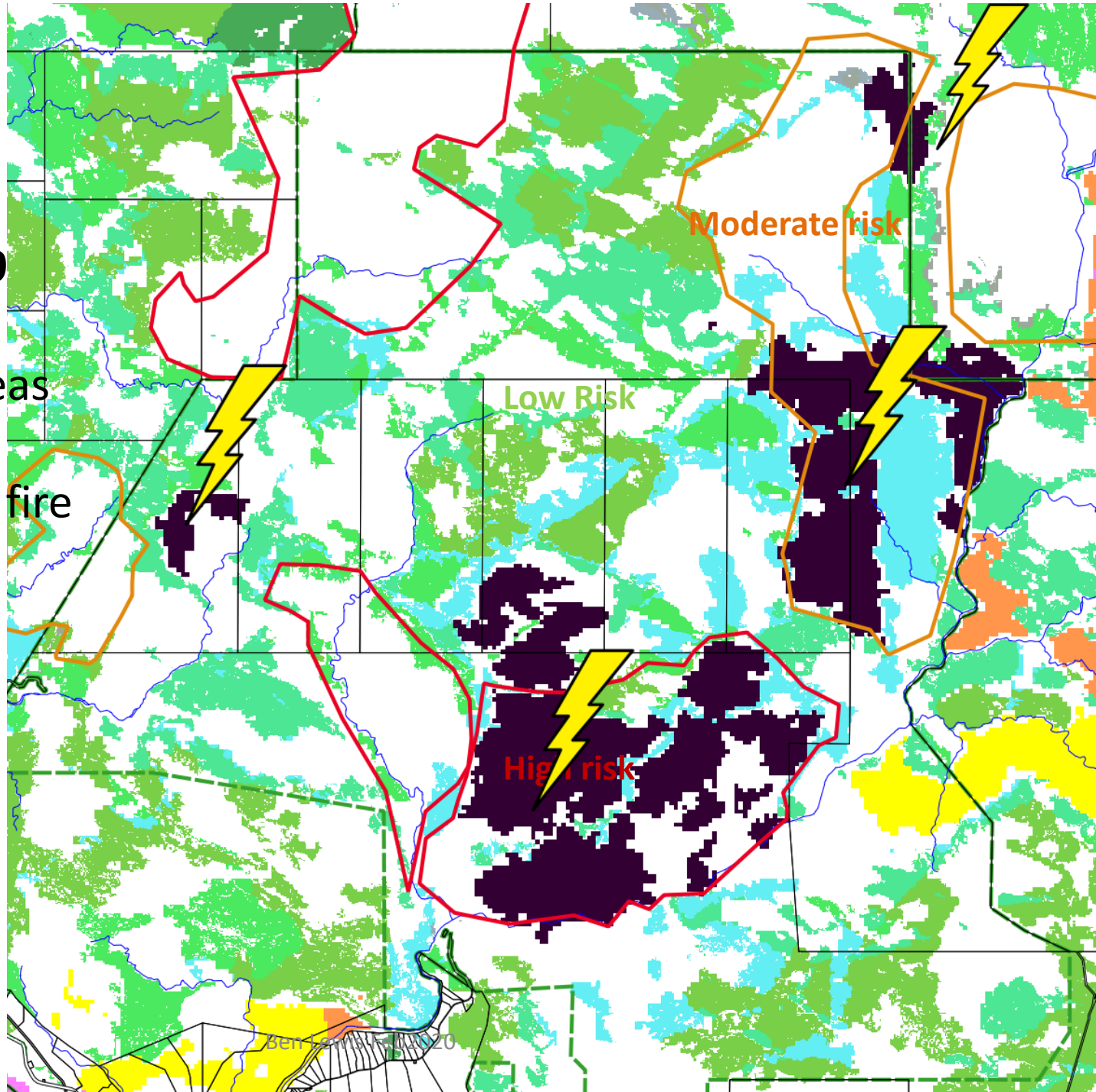
Lower incidence in rangelands than typical

Lightning fire window



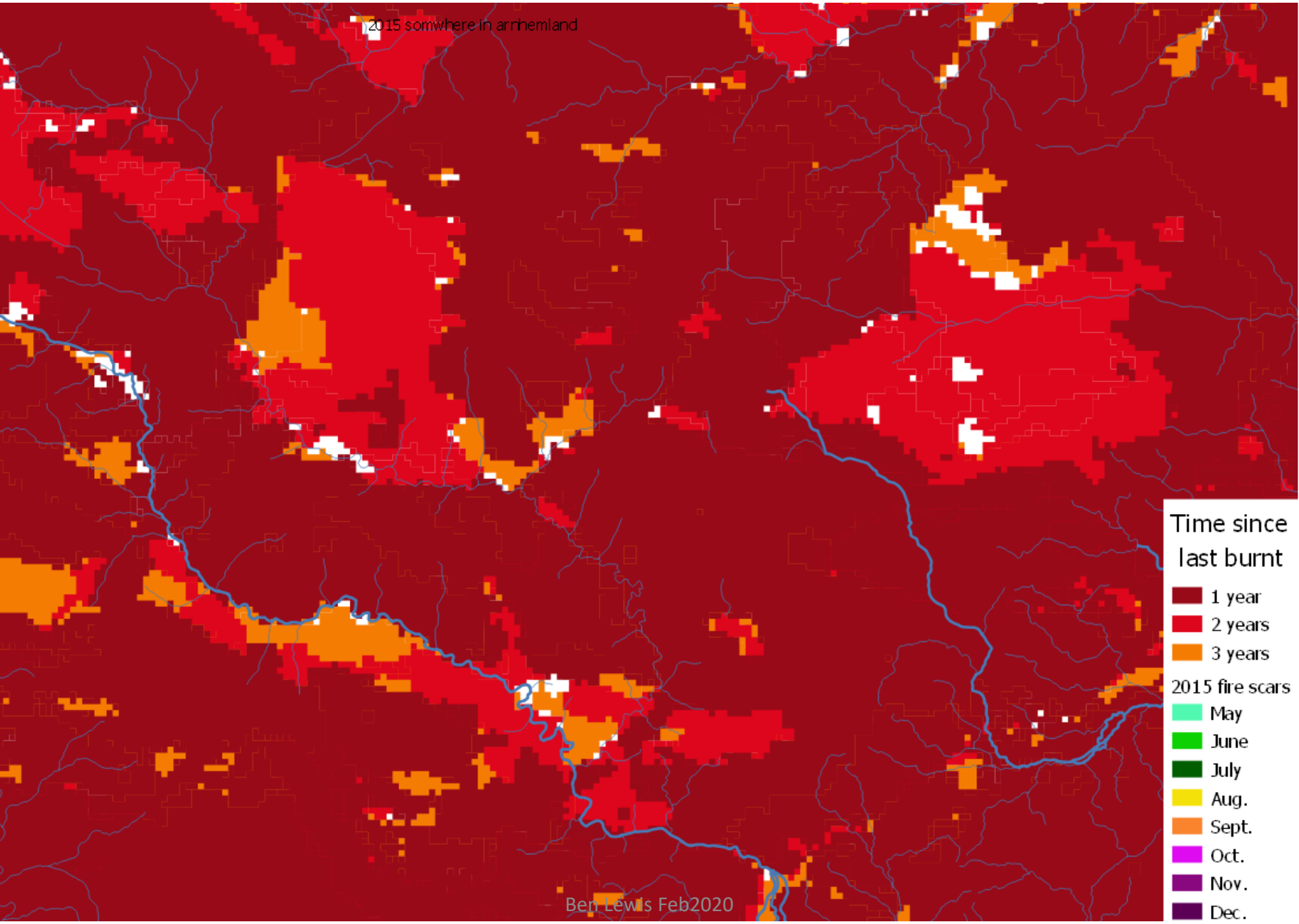
Wildfire Risk 2019

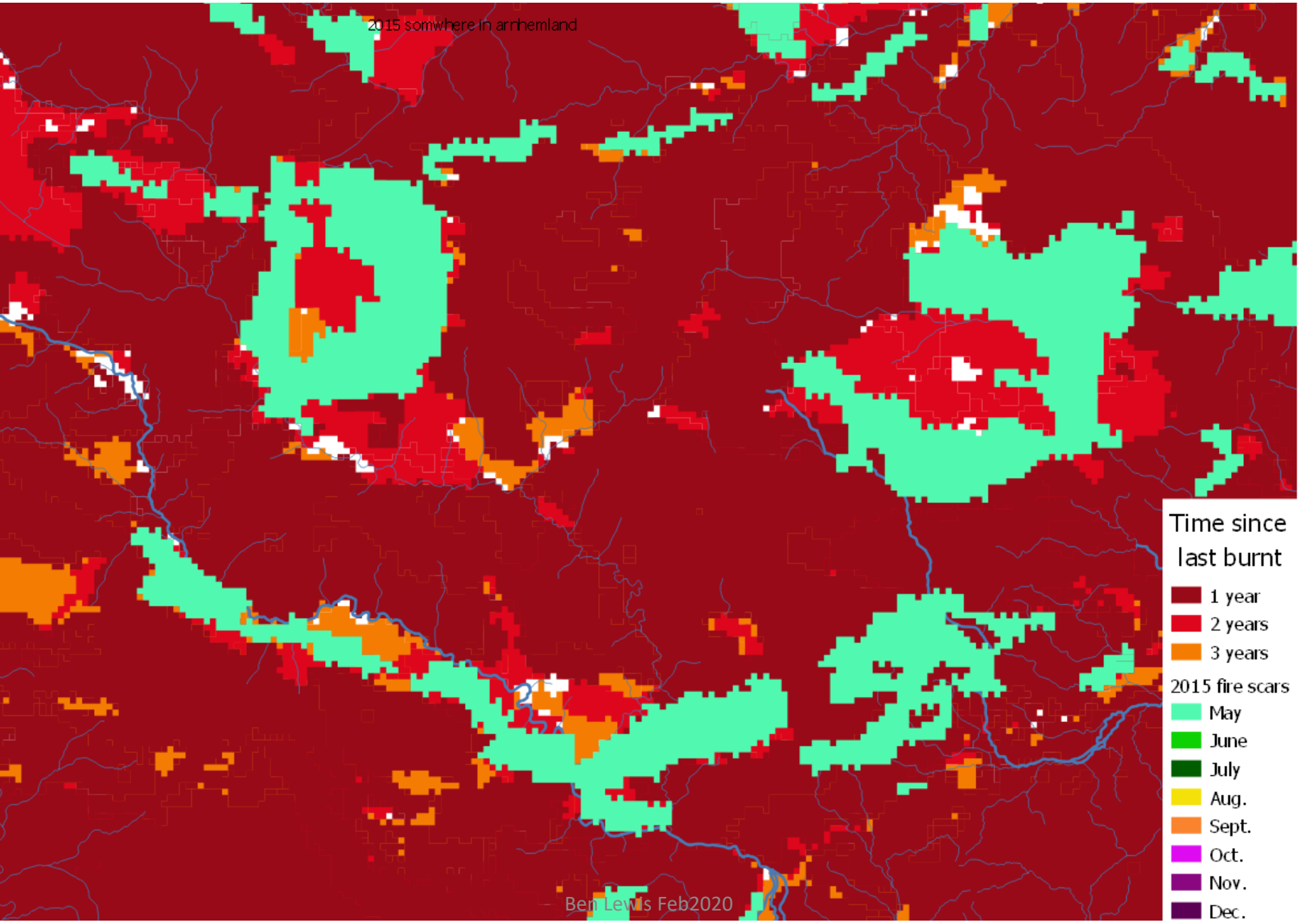
50 wildfire risk areas mapped
20% had lightning fire



Dominant lightning fire likelihood factors

Landscape fire risk assessment spatial traits of fire risk levels	
low risk	high risk
islands of grass in a sea of burnt	islands of burnt in a sea of grass
small unburnt patches	very large unburnt areas
assets secured	assets exposed
effective burnt fire breaks	patchy discontinuous fire breaks
many secure long unburnt patches	large and unsecure, Long unburnt patches
not exposed to likely ignition sources	exposure to likely ignition sources
other types off firebreak/access	remote, inaccessible.


2015 somwhere in arnhemland
Time since last burnt
1 year
2 years
3 years
2015 fire scars
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Ben Lewis Feb2020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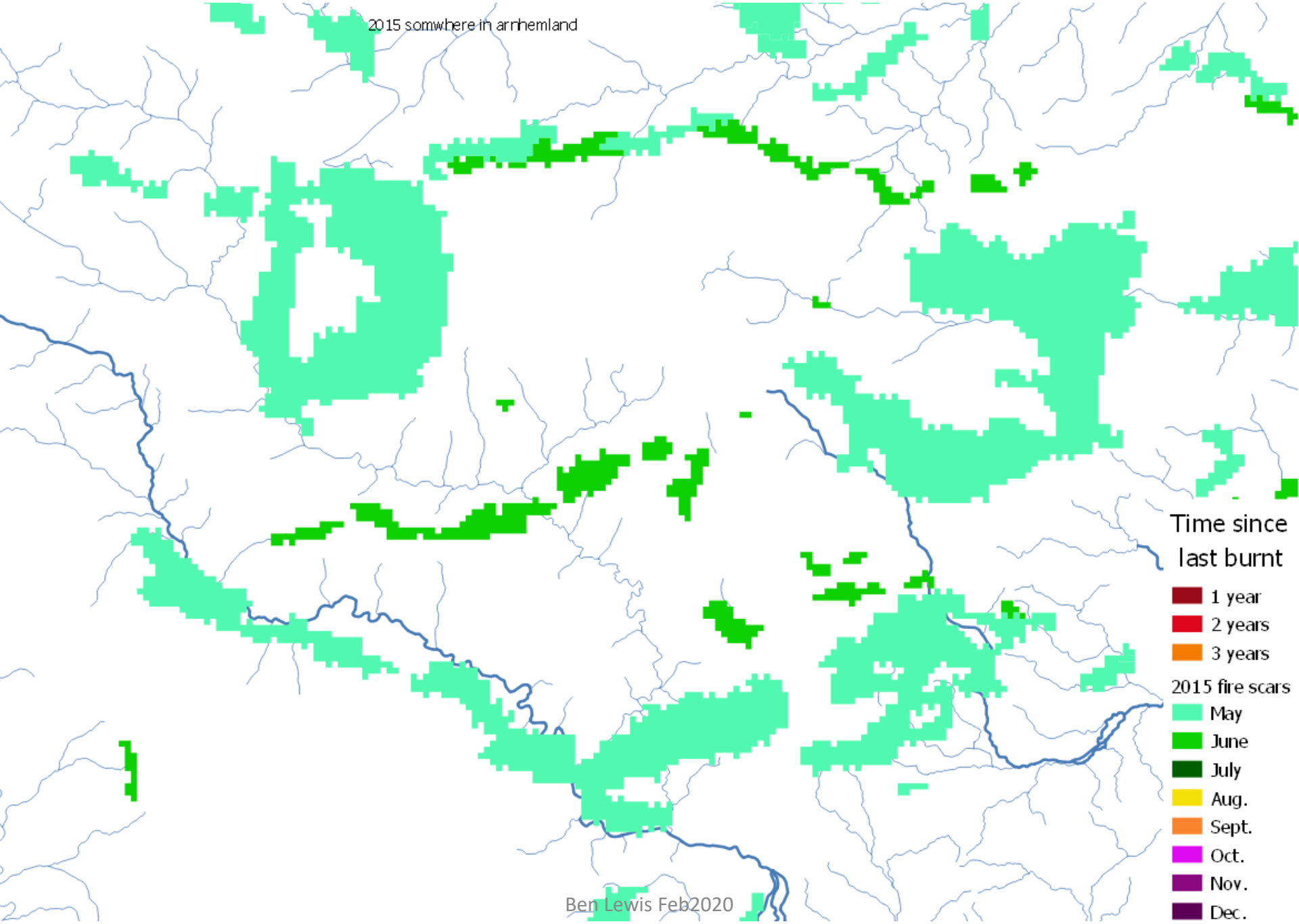
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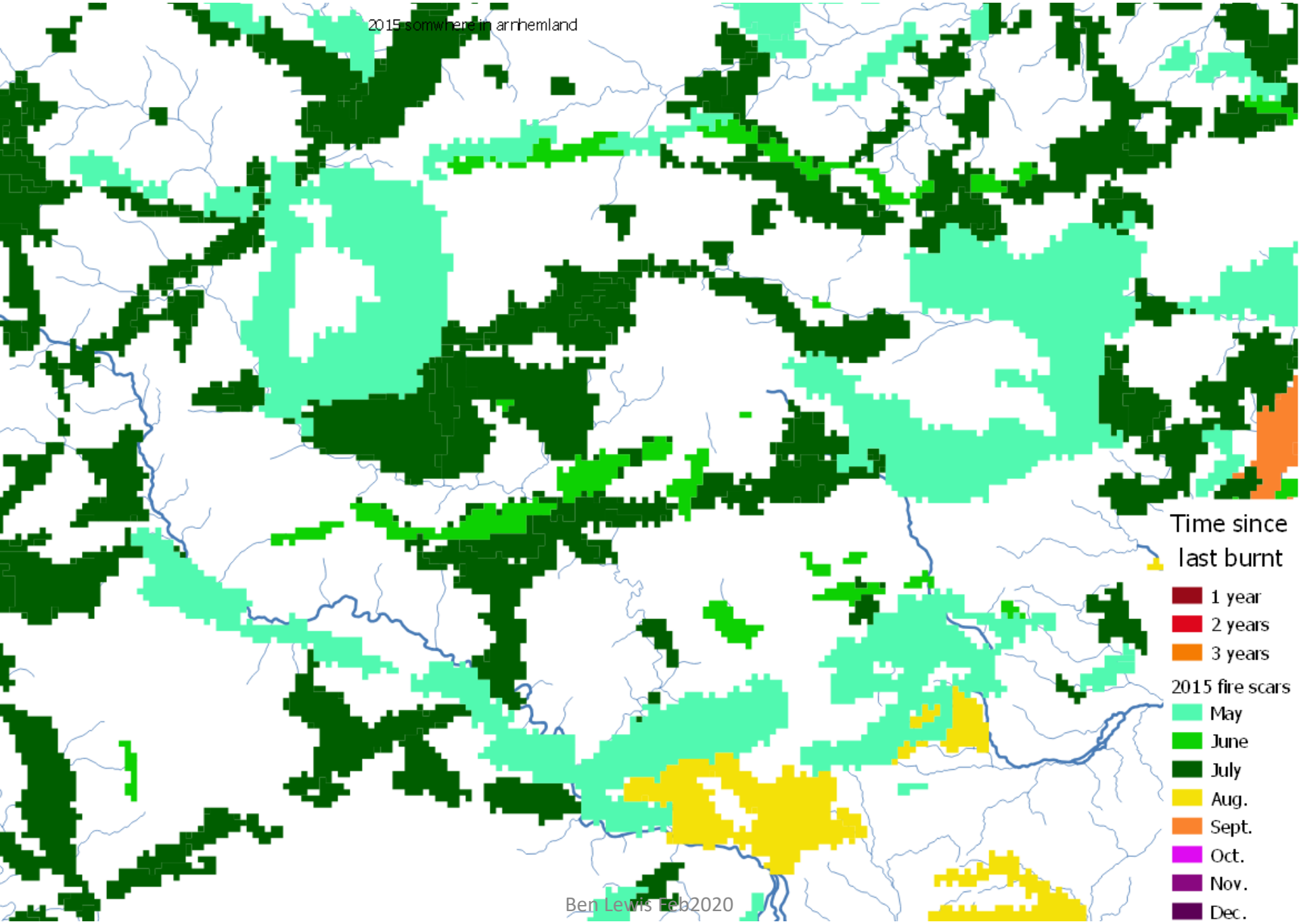
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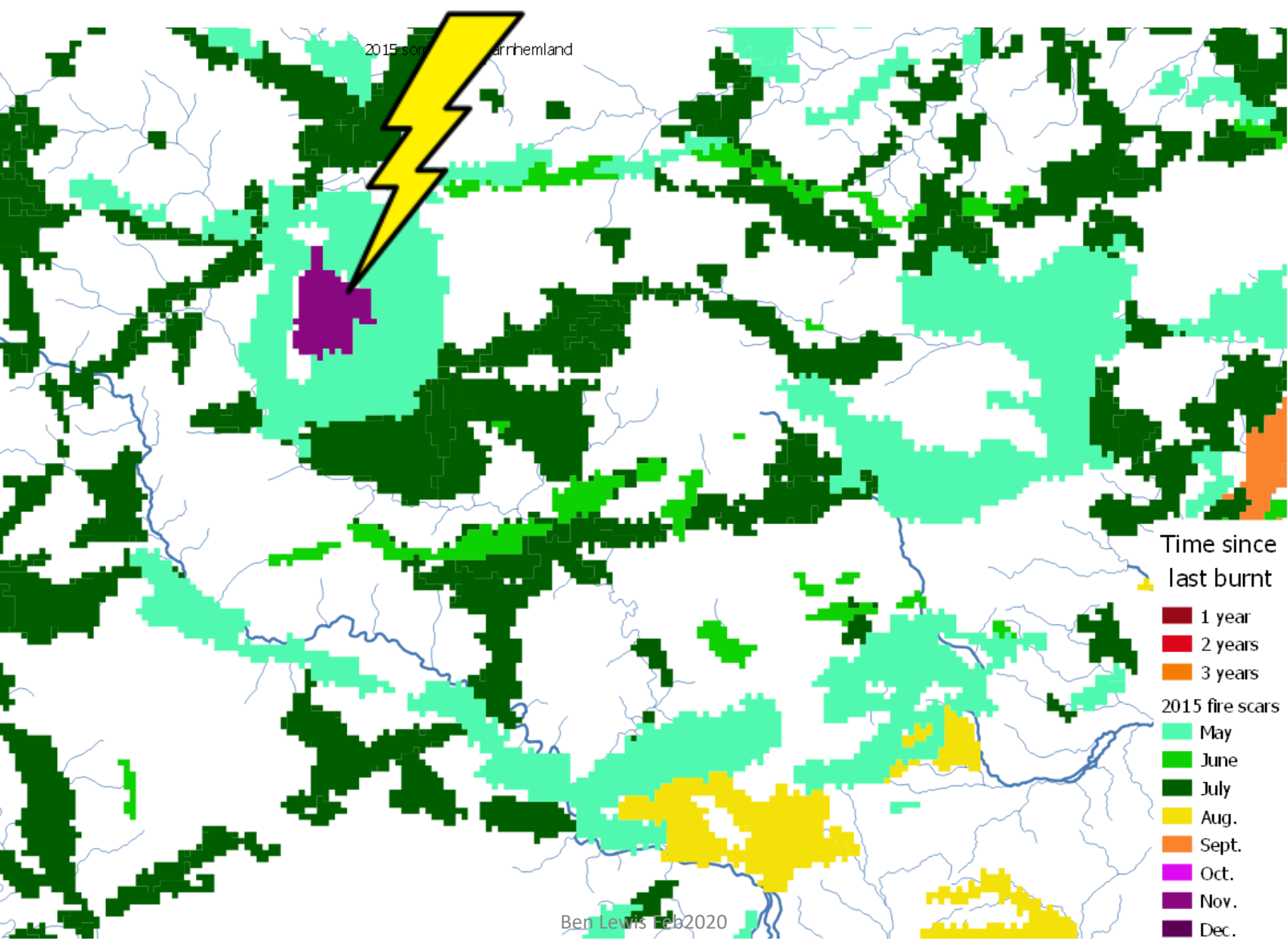
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Conclusion

Some simple truths:
larger areas are more likely to be struck by lightening
Old fuels (higher fuel loads) are more likely to catch on fire and spread

Apparent trends and factors
Strategic burning + suppression are reducing the area burnt by lightning fire
more lightning fires starting in Arnhem region, simply more grass available during lightning window?

Questions:
What are some scenarios that overwhelm our current strategies?

- An extreme fire weather burst post lightning
- Many ignitions in a short period
- High fuel loads

Are some types of country more likely to have lightning fire, Floodplain? Certain ground types?
Climate change ↑Heat = more energy = more lightning (*Romps 2014*) is it true for our region?
Can we better forecast lighting fire window year to year?