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Spark - What is it, and how does it use Bureau weather data.

A real-world application

DATE

Sept 2024

PRESENTER

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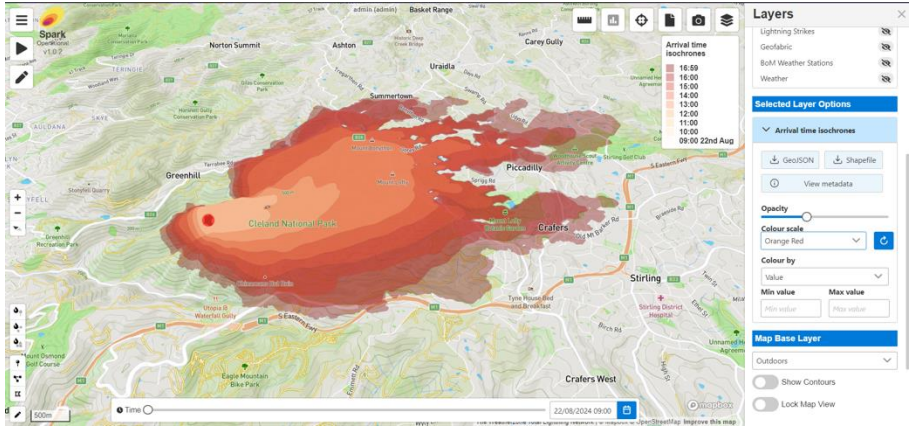
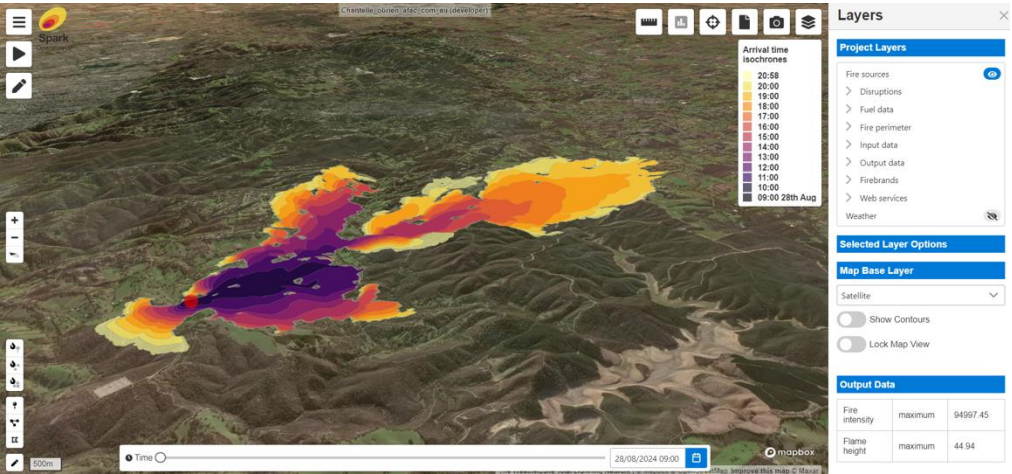
What is Spark





- Collaborative project between CSIRO and AFAC
- Fire simulation tool
- Uses fuel load, fuel age, topography, road network, weather data
- Data sensitivities
- Adapted AFDRS fire behaviour models
- Sub models simulate plume and firebrand generation

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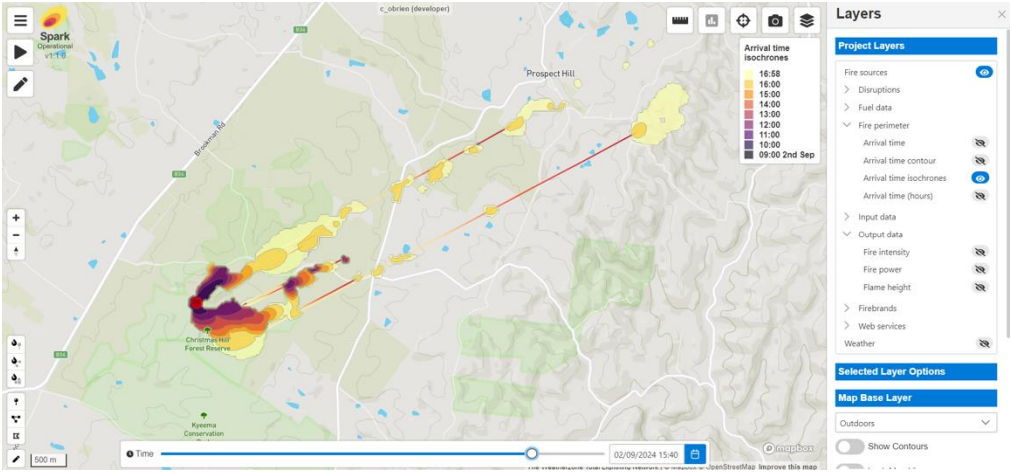
What is Spark

- Different to weather model (ACCESS Fire)
- Time to run
- Computer/server types
- Differences in spatial data resolutions (Spark can be 30m, ACCESS C 1.5 km, GFE 6km)
- Need high resolution for simulations



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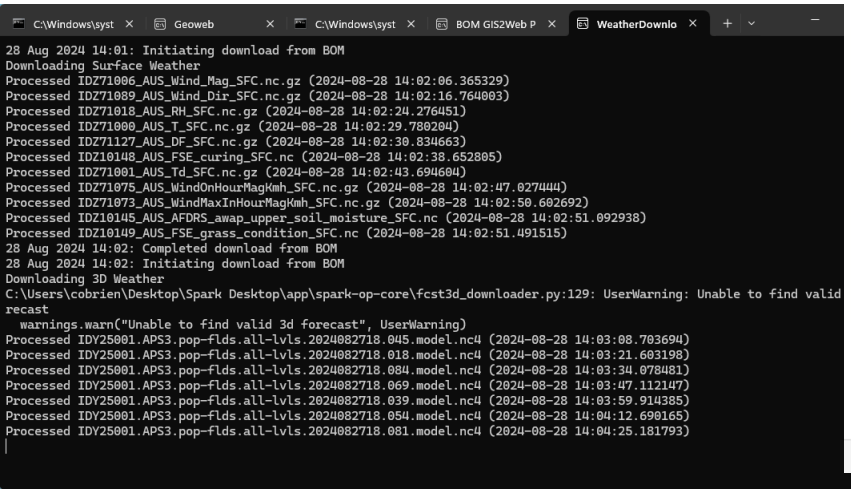
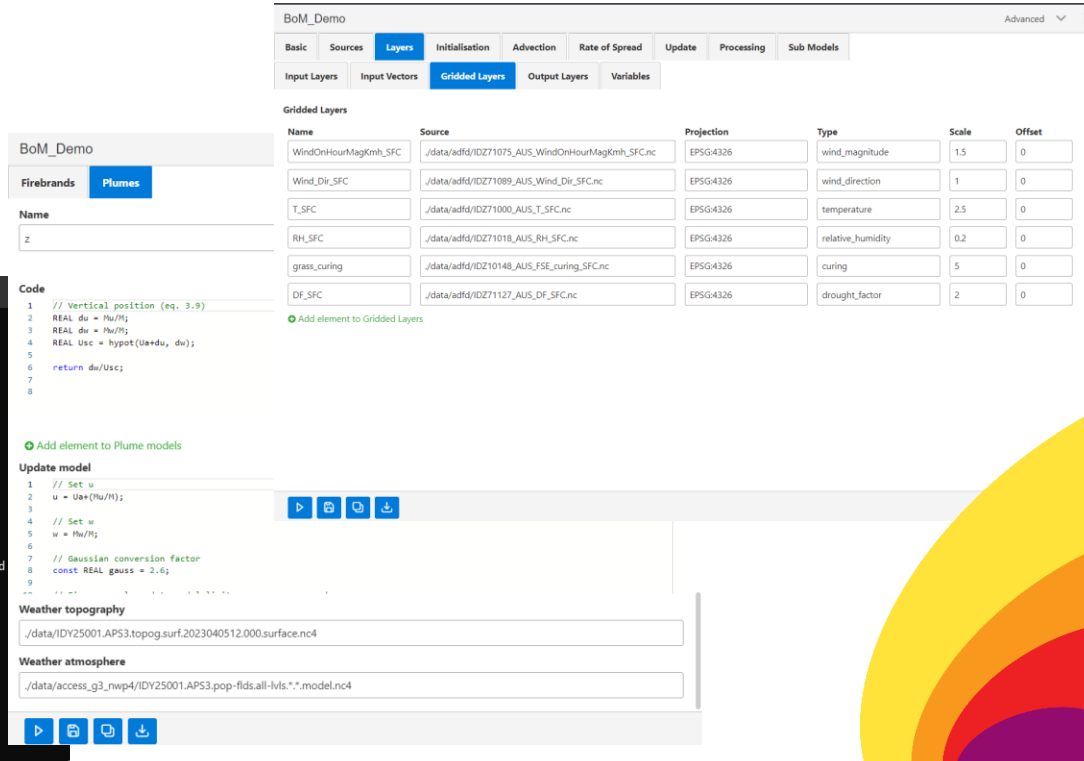
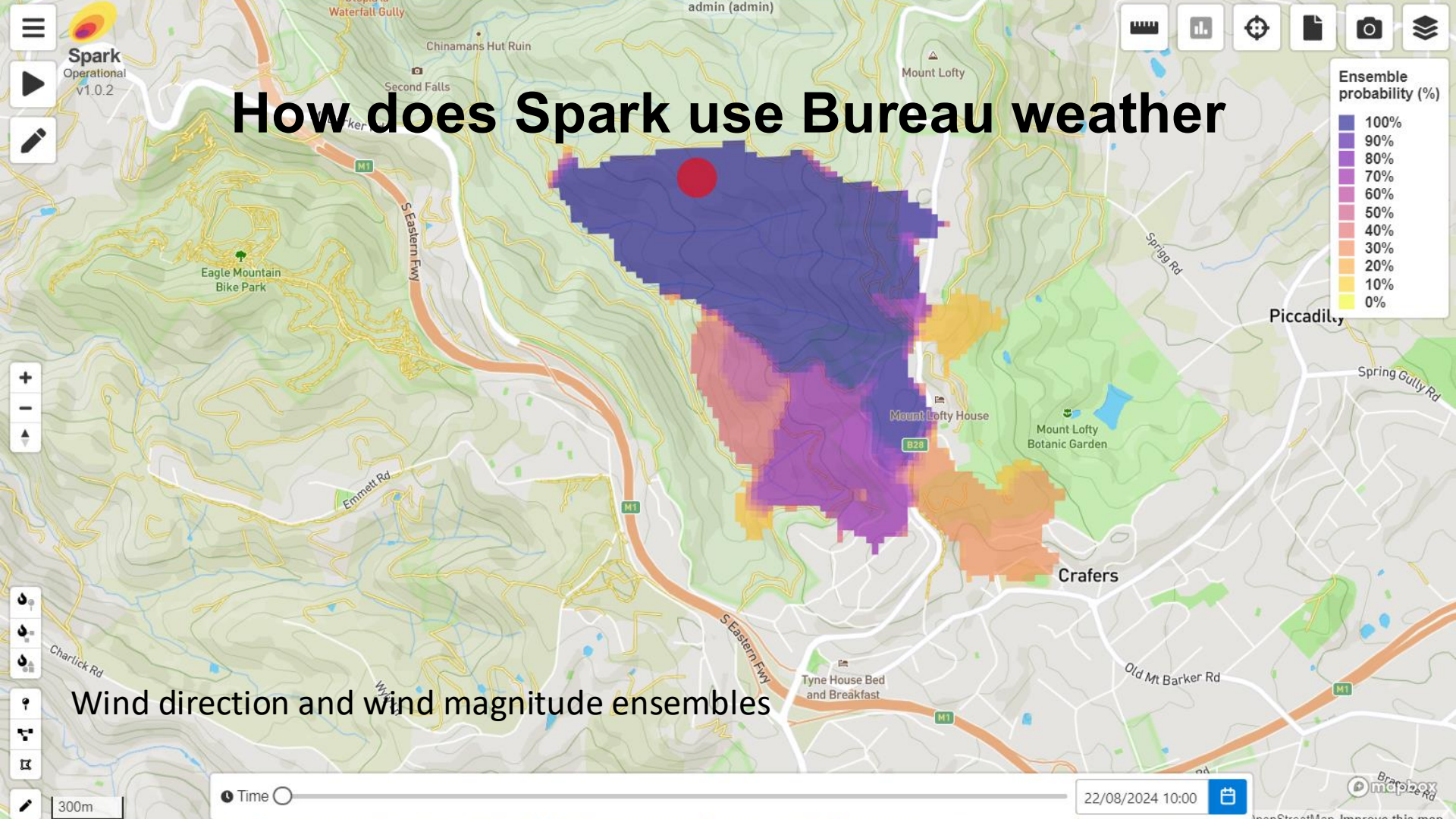
How does Spark use Bureau weather

- Gridded surface weather - ADFD via FTP
- 3D weather parameters
- CSIRO developed ‘weather downloader’







Wind direction and wind magnitude ensembles

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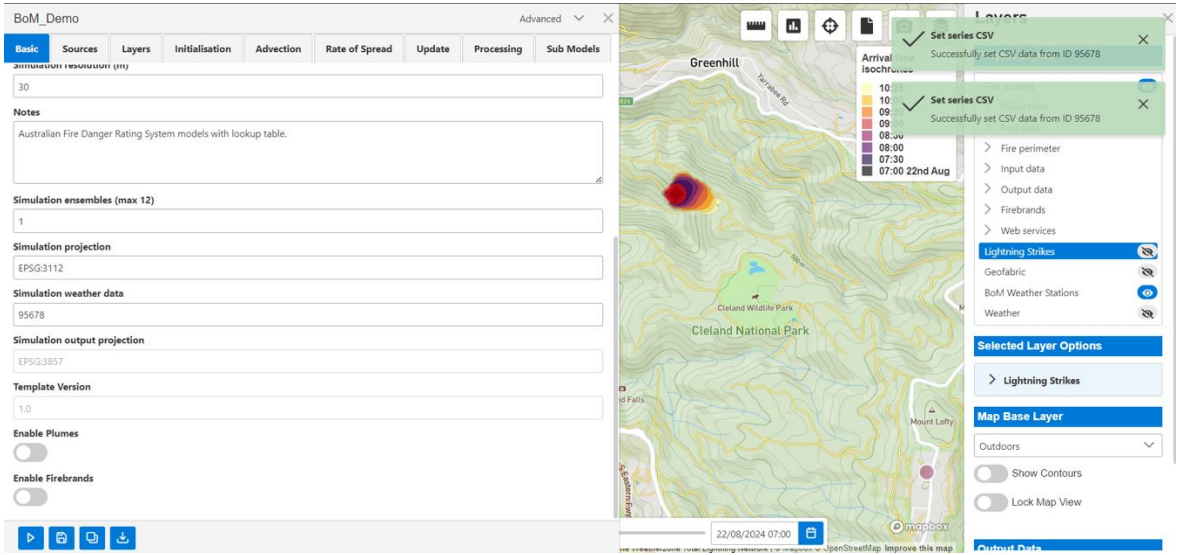
AWS observations

Spark can use AWS point observations to do hindcasting simulations
– if runs beyond observations, will fill with gridded forecast



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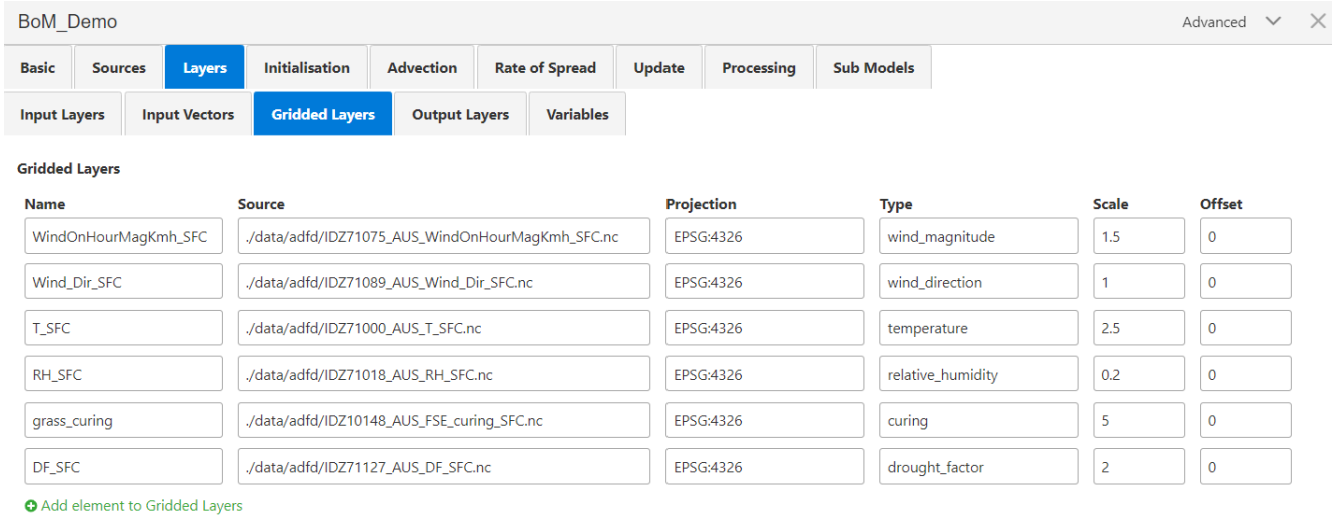
Weather manipulation



If forecast weather isn't matching on ground observations or AWS observations, weather inputs can be manipulated.

- Scale and offset
- Editing of csv and xml files

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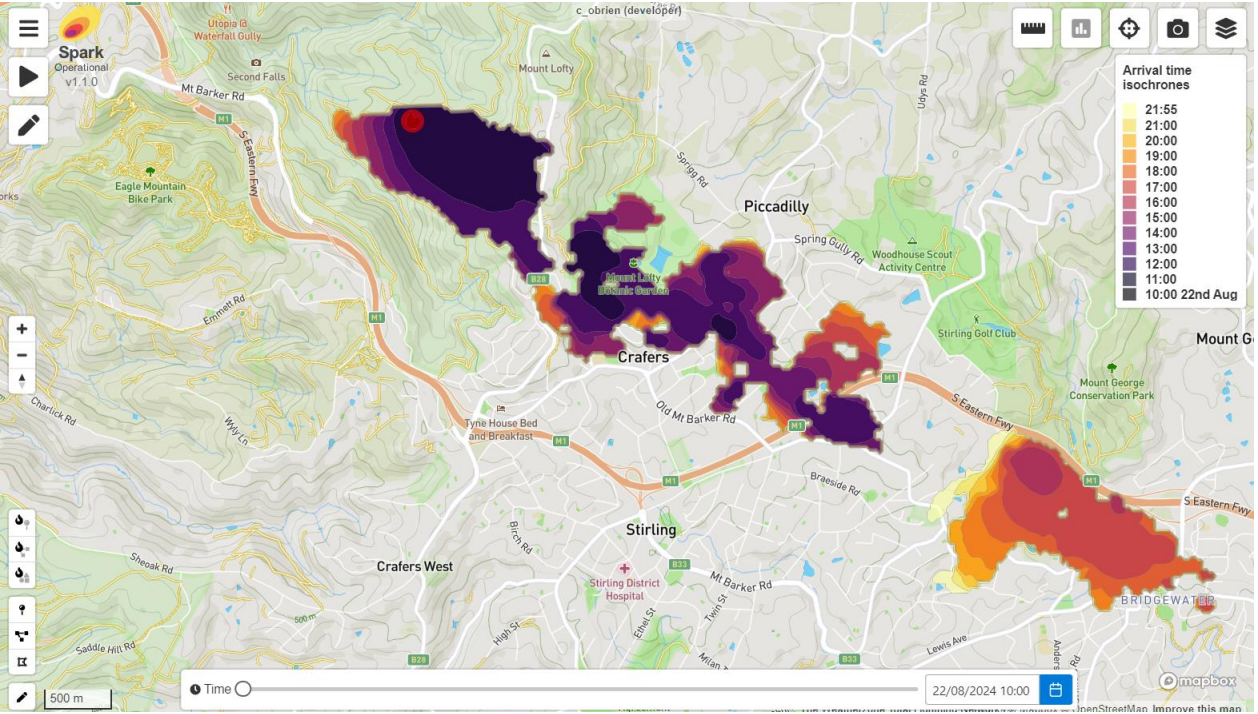
Current challenges



- Ease of access of Bureau weather – CSIRO built downloader
- NetCDF format
- Historical and realtime datasets different
- ADFD grids are overwritten 5 times a day
- Gridded weather – 6km grid – lack of local effects
- IWF ingestion – currently only receive as a PDF – electronic aren't distributed

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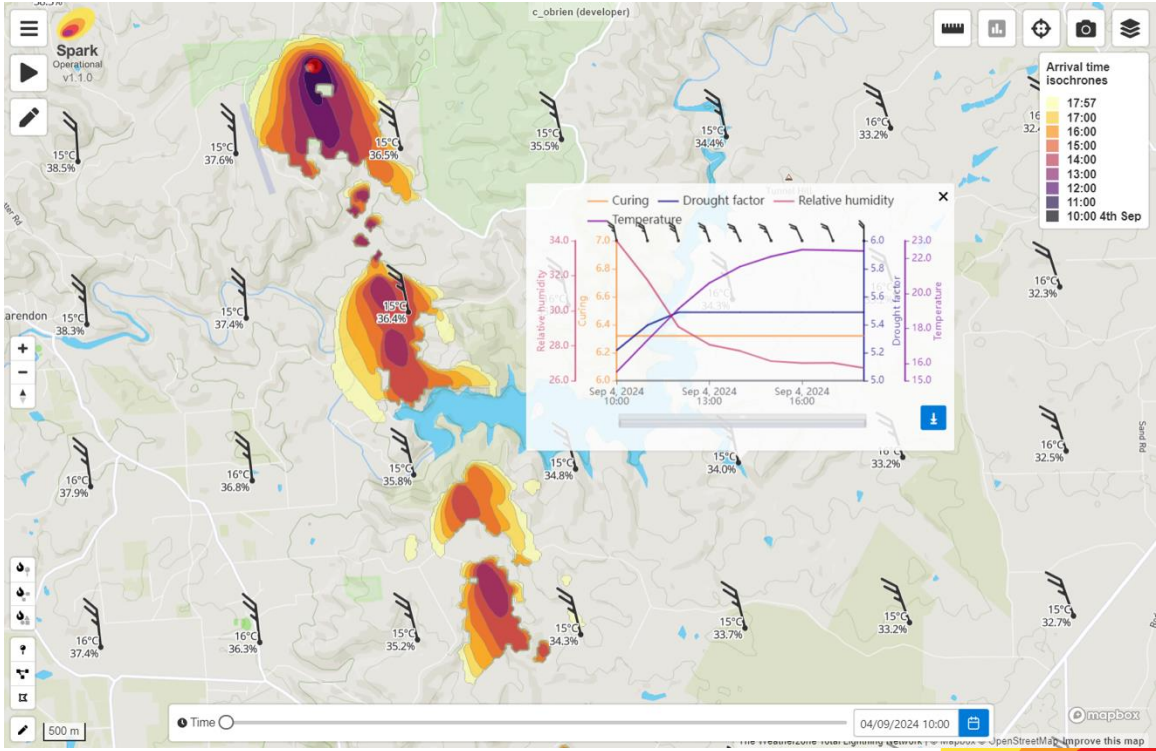
Future Opportunities

- World leading in fire simulation
- Test with winds at 300 or 100m resolution using high resolution ACCESS
- Test with ACCESS Fire with spotting – combine ACCESS Fire with Spark spotting simulation model
- Jeff Kepert's parametric Ember Transport scheme
- Compare with satellite data for real time verification
- Potential for forecast demo collaboration project
- Real time collaboration using satellite data, mobile radar data which enables real time verification of fire perimeters



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Thank you

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