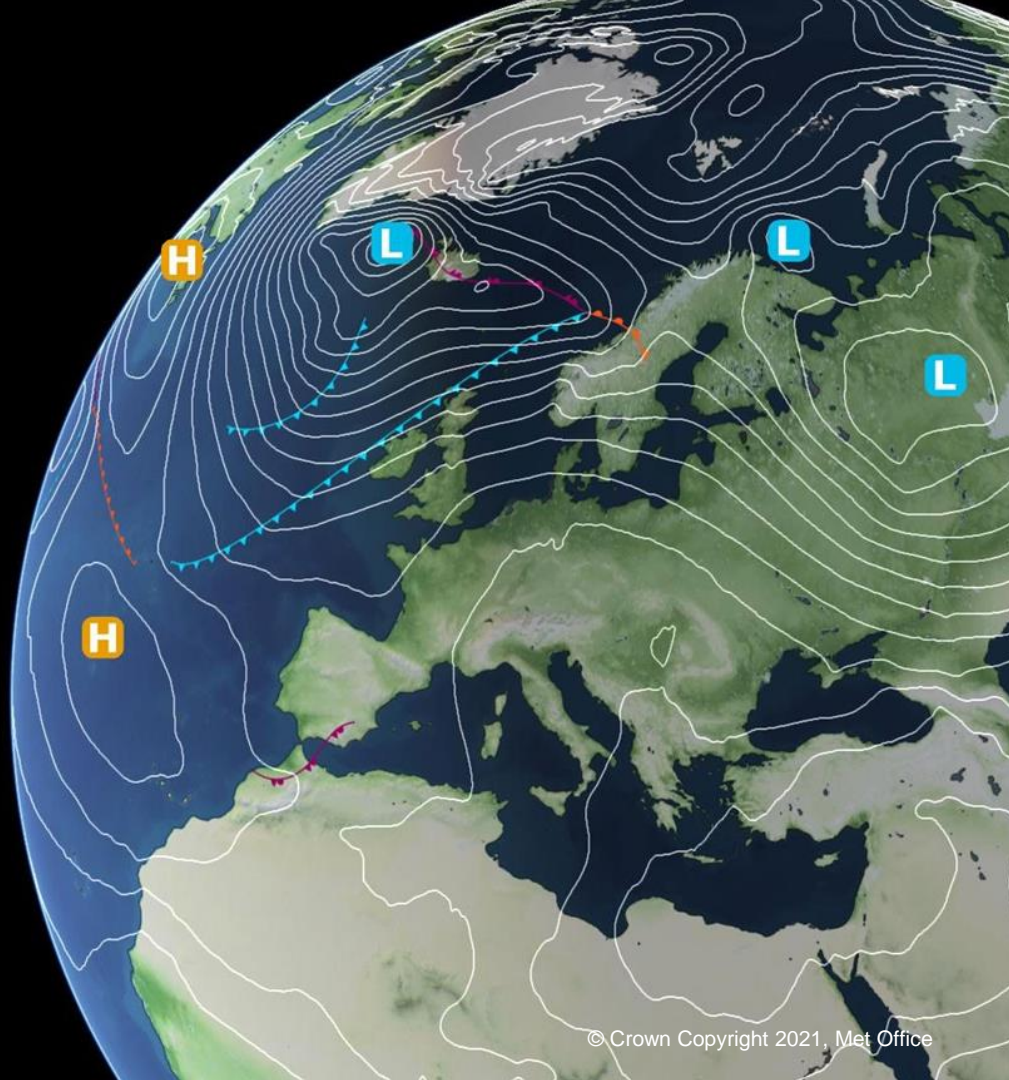


JULES MODULES

FIRE

Chantelle Burton, Doug Kelley
Gerd Folberth



FIRE MODULE:



Proposed new module, separated from Biogenic Fluxes (Gerd Folberth and Kirsti Ashworth)

To include INFERNO (flammability, burnt area, fire-vegetation coupling, emissions) and fire indices (FFDI, FWI, Nesterov)

Proposed module leads:

Chantelle Burton Met Office Hadley Centre chantelle.burton@metoffice.gov.uk

Doug Kelley UK CEH, doukel@ceh.ac.uk

Highlights/conferences this year

- JULES fire workshop: July 2021, ~70 participants
- Ongoing Leverhulme workshops and conferences
- e.g. Fire in the North: led by Sandy Harrison, northern high latitude fires. 12th Jan 2021
- 11-15th Jan 2021 ISIMIP workshop, including fire
- UNEP report “Spreading like Wildfire: The Rising Threat of Extraordinary Fires”, to be published in Sept 2021

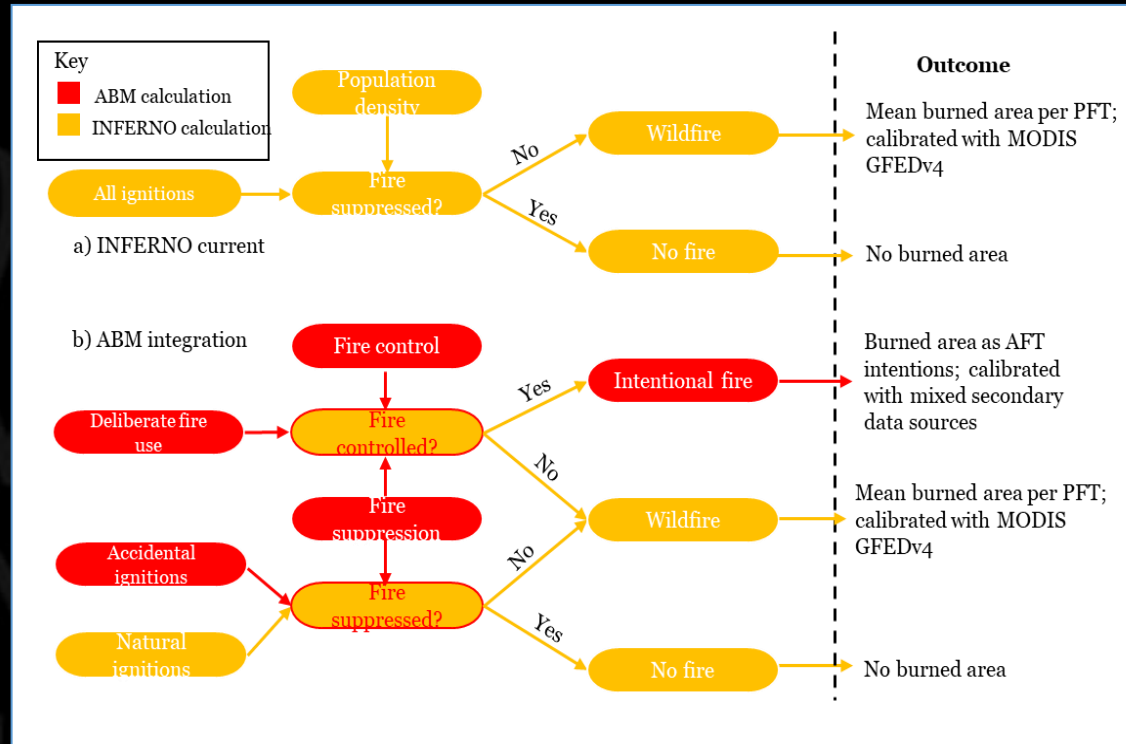
-> See list of publications on the JULES website

Example work in progress across the fire community

- Alex Kuhn-Regnier (Imperial) - currently working on an alternative, empirical parametrisation for INFERNO based on previous work (<https://bg.copernicus.org/articles/18/3861/2021/bg-18-3861-2021.html>; supervised by Apostolos, Colin, and Sandy). We hope to be able to do away with the PFT-specific typical burnt areas by taking advantage of pre-season productivity (proxies), for example.
- Mika Peace (BOM) - currently working on the implementation of the national fuel grids into ACCESS-Fire and anticipate a couple of papers and a report will be published by the end of the year. We will also be pushing our code back onto the UM (JULES) trunk so that other users can work with the model.
- Introducing peat fires (Katie Blackford, Imperial)
- LGM simulations (Matt Kasoar, Imperial)
- Future fires / ConFIRE. Doug Kelley (UKCEH)
- Future fires / ISIMIP FireMIP. Chantelle Burton, Camilla Mathison, Eleanor Burke, Andy Hartley (MOHC), Doug Kelley (UKCEH)
- Fire & optimisation for UKESM 2.0 - Chantelle Burton, João Teixeira, Doug Kelley

WHAM! (Wildfire Human Agency Model) & coupling with JULES-INFERNO

- INFERNO treats all ignitions as similar events – but human agency leads to *categorical* differences in fires' frequency-size distribution
- E.g. A 1m² bonfire is categorically different from a forestry service prescribed burn > 100ha
- WHAM! splits anthropogenic fire into deliberate, accidental & escaped – (managed fires that become uncontrolled wildfires)
- Model framework could be repurposed for other aspects of land system: e.g. water or fertilizer use



Wish list

Is anyone working on this, and what is the status?

- Pyro-convection
- Deposition of black carbon on ice (and changes to albedo, melting ice etc) and ocean
- Deforestation fires / fragmentation?
- PFT adaptation to fire

....Anything else?