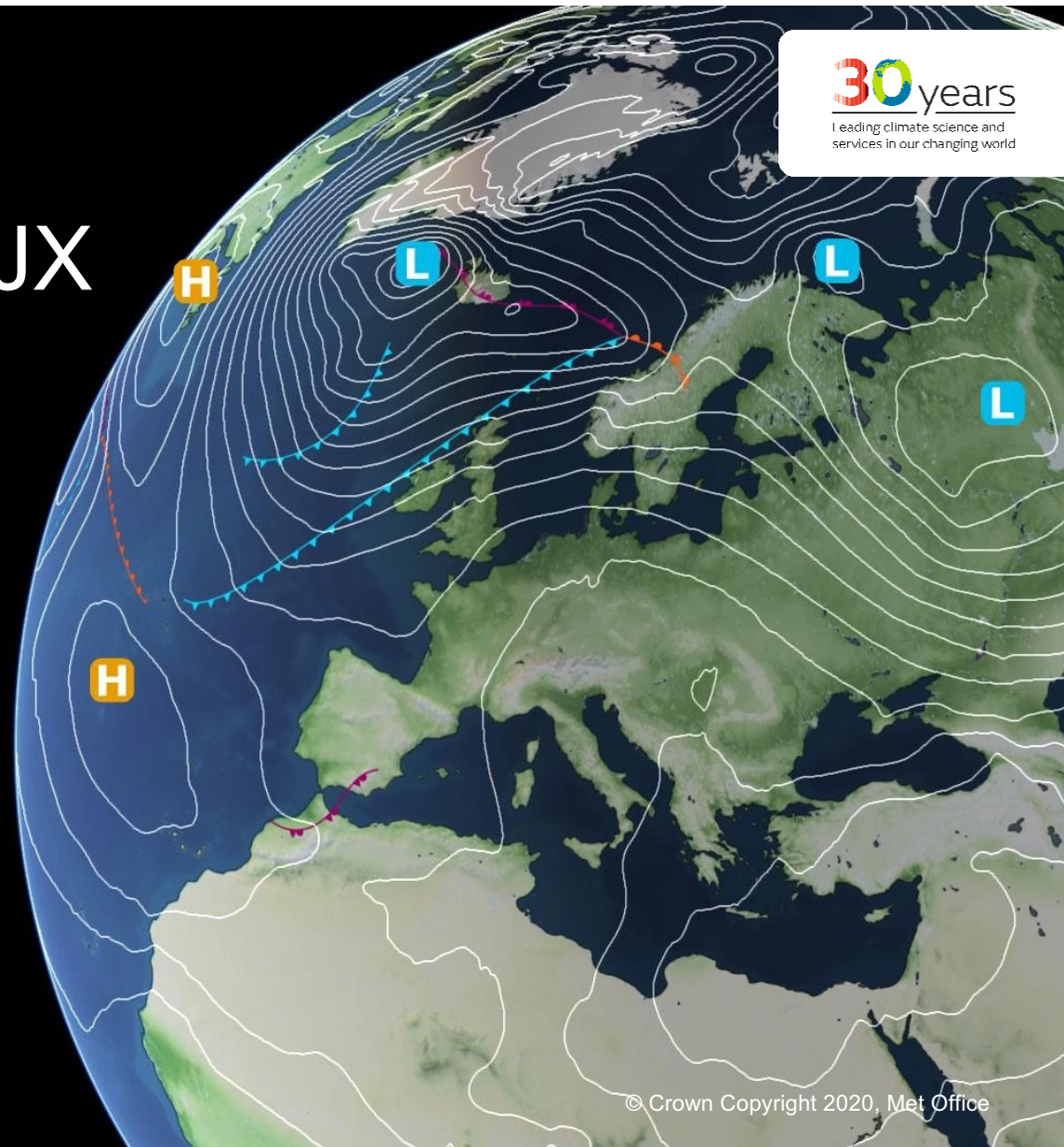


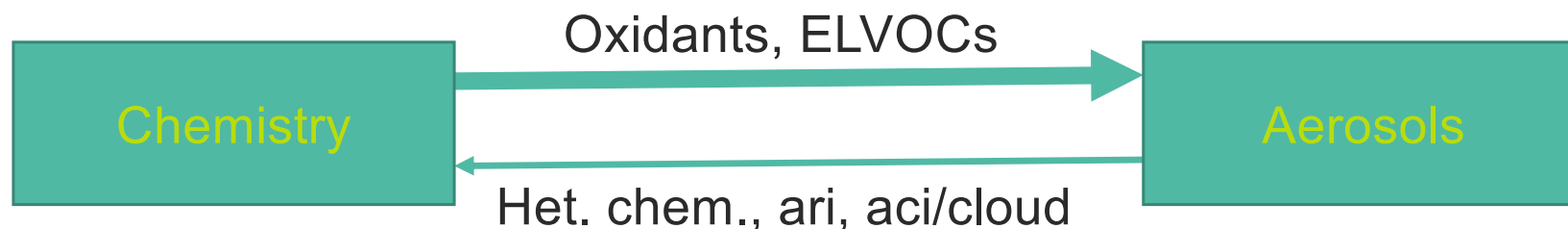
GLOMAP-mode/Fast-JX Coupling

UKESM UKCA Science Advances 2021

Fiona O'Connor, with input from Michael Hollaway
and Oliver Wild



[Karset et al., 2018](#)
[O'Connor et al., 2021](#)
[Sengupta et al., 2021](#)

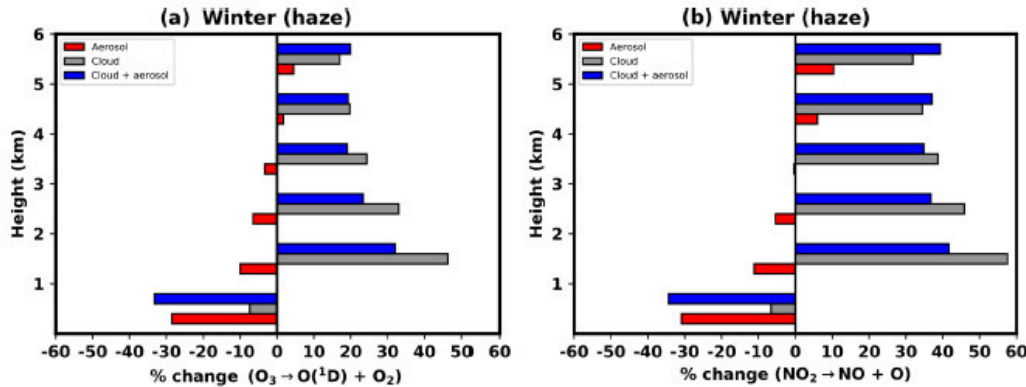


[Jacob, 2000](#)
[Keeble et al., 2014](#)
[Real et al., 2011](#)
[O'Connor et al., 2021](#)

No direct coupling between aerosols and Fast-JX in UKESM1

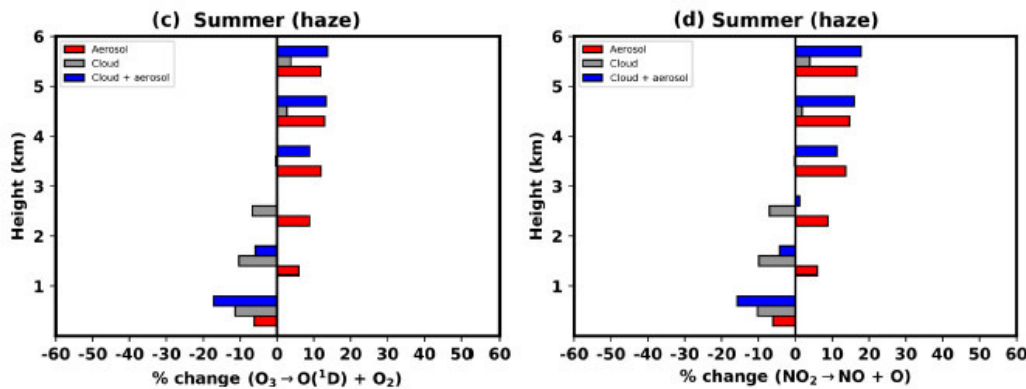
Why do we care?

Winter



Aerosols: greater impact than cloud cover at the surface during winter

Summer



Aerosols: greater impact than cloud cover through most of the troposphere during summer

BEIJING

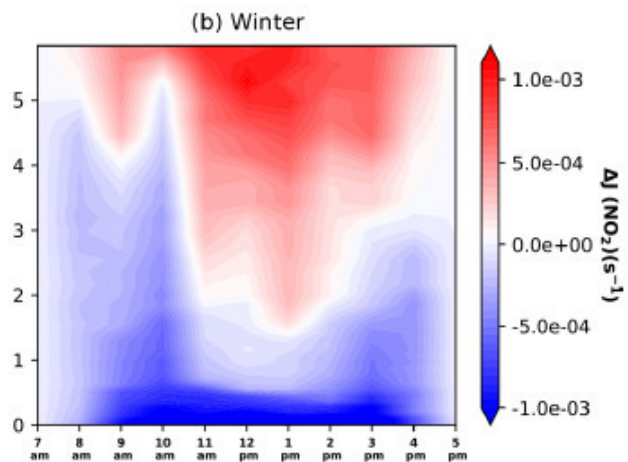
$j(O^1D)$

$j(NO_2)$

[Hollaway et al., 2019](#)

Why do we care?

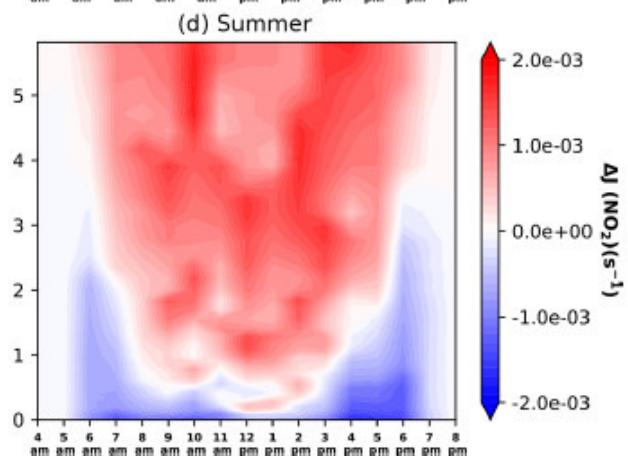
Winter



Aerosol-only effects:

Slowing down of BL
photochemistry with
enhancements aloft

Summer



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[Hollaway et al., 2019](#)

To introduce direct coupling between aerosols and photolysis rates

- Code branch available at [UMvn10.8](#)
- Documented under UM ticket [#2689](#)



Courtesy of
Michael Holloway

Next Steps

- Upgrade branch to latest UM version
- Testing, scientific & technical assessment, and documentation
- Lodge for Oct/Nov 2021 UM code freeze
- UKESM2 ticket & corresponding testing/assessment

Funded to do this under new EU Horizon 2020 ESM2025

