

WP2 update

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WP2 update

- ▶ Downscaling
 - ▶ Ilya and Jonathan's `mesoclim` R package is ready to go and being tested on Jasmin
 - ▶ Ivis will take about GMRF-based methods generating other RCPs later

Pest and disease risk

- ▶ Dan has started work on a draft paper on using the Plant Health Risk Register (PHRR) to estimate risk to UK trees
 - ▶ its working title is *Potential impacts of plant pests and diseases on trees and forests in the UK*
- ▶ These data will be coupled for the simple generic infection model of Magarey et al. (2005) ¹
- ▶ R code to implement the model in the form of R package `infect` is up on GitHub
- ▶ Jonathan has considered how we'll drive it with UKCP18 data
- ▶ We still need to decide on how we'll take PHRR's semi-quantitative data (e.g. likelihood of arrival in next five years taking values 1, 2, 3, 4, 5) and make it fully-quantitative (e.g. probability of arrival in next five years), which is non-trivial!

¹Magarey, R. D., T. B. Sutton, and C. L. Thayer. (2005). A simple generic infection model for foliar fungal plant pathogens. *Phytopathology* 95 (1): 92–100. <https://doi:10.1094/PHYTO-95-0092>.

Driving the simple generic infection model with UKCP18 I

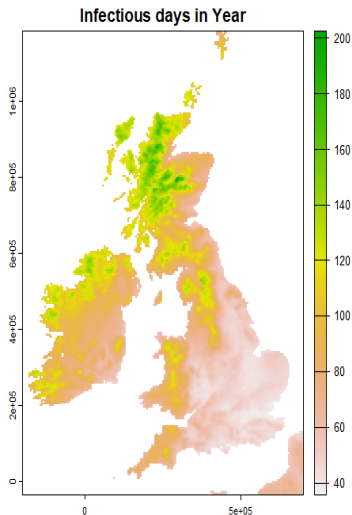


Figure 1: Jonathan's plot identifying disease prone days I

Driving the simple generic infection model with UKCP18 II

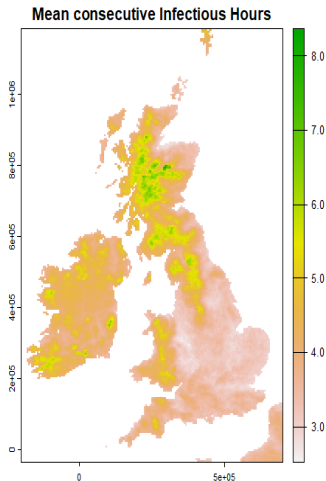


Figure 2: Jonathan's plot identifying disease prone days II

Driving the simple generic infection model with UKCP18 III

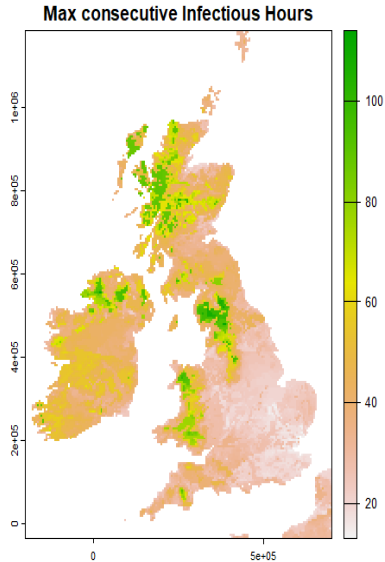


Figure 3: Jonathan's plot identifying disease prone days III

Other risks

- ▶ Next task is fire risk
 - ▶ due to time frames, incorporating this into JULES-RED has been ruled out
 - ▶ works exists that we can use to allow for trends in fire risk (Perry at al., 2022)²
 - ▶ scope to try and link fire risk approach to that of pest and disease risk
 - ▶ e.g. post-processing the JULES output via a fire risk index
- ▶ Heat wave risk and flood risk
 - ▶ possibly partially covered by downscaled climate data going in to JULES



Wind risk

²Perry, M. C., Vanvyve, E., Betts, R. A., and Palin, E. J.: Past and future trends in fire weather for the UK, Nat. Hazards Earth Syst. Sci., 22, 559–575, <https://doi.org/10.5194/nhess-22-559-2022>, 2022.

The bigger picture

- ▶ Ultimately,