Sentinel-2 satellite shows that cereal harvesting substantially contributes to peak *Alternaria* spore concentrations in Central-Northern Europe

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Introduction

- ***Aim**:* To examine, using remote sensing, the contribution of cereal harvesting to peak *Alternaria* spore concentrations.

- Combine cereal harvesting releases large amounts of *Alternaria* spores into the atmosphere.
- Peak spore periods occur in the summer but difficult to estimate the time and source due to insufficient observation sites.
- Sentinel-2 satellite images can detect peak spore periods and locations during cereal harvesting over large biogeographical area.

Methods

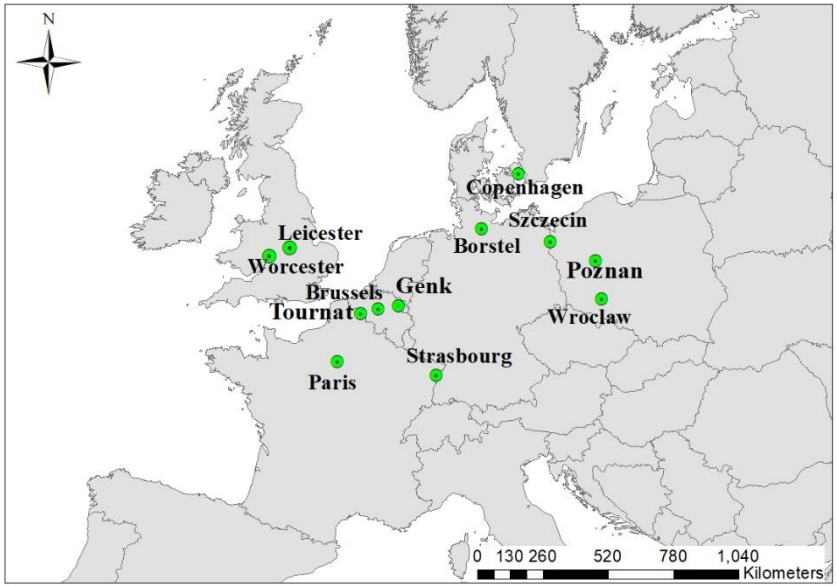

Fig. 1 Spore sampling locations

- Spore sampling: Burkard/Lanzoni 2016-2018.
- Sentinel-2 images analysed Jun-Aug
- HYSPLIT back-trajectory calculations analysed alongside Corine Land Cover 2018.
- Eurostat 2016 analysed for the 12 sites (Fig. 1) and groundtruth cereal harvest data for Worcester.
- Meteorological data during harvest period: Jun-Aug

Results (preliminary)

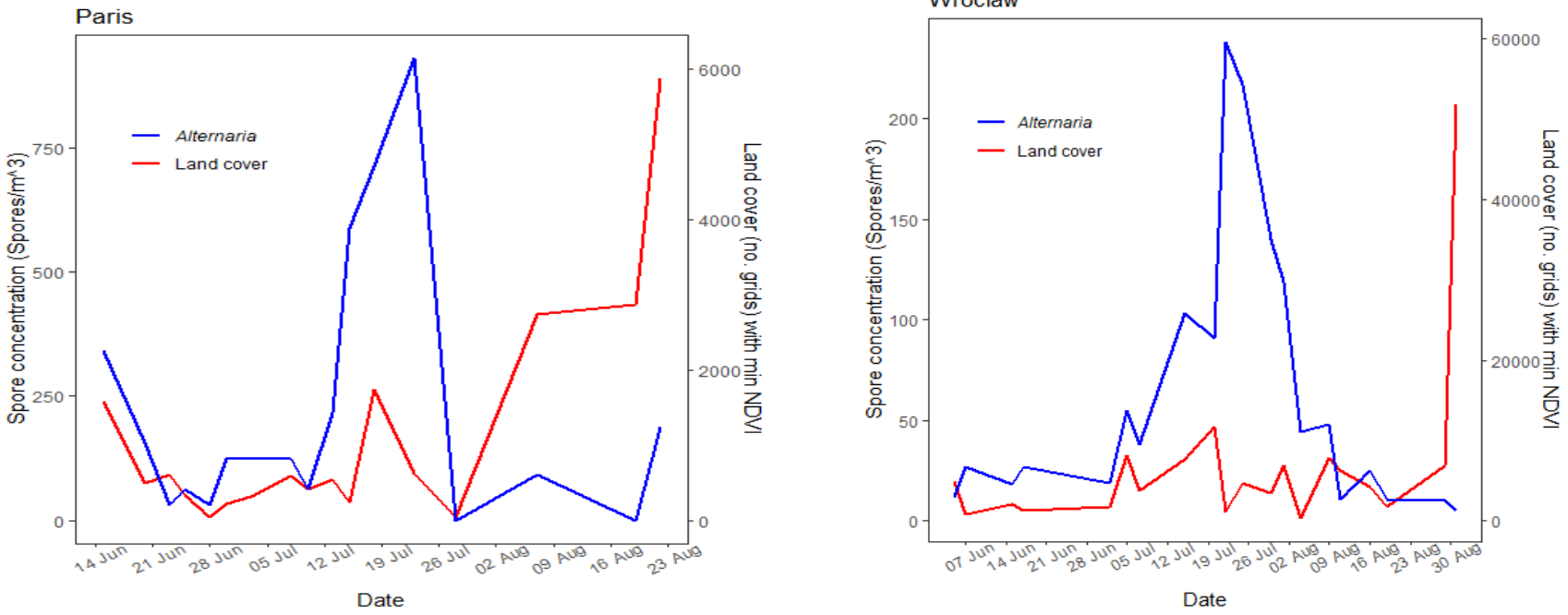

Fig. 2 Relationship between *Alternaria* spore concentrations and land cover with minimum NDVI values during cereal harvesting period (Jun-Aug 2018) at Paris and Wroclaw.

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Results…

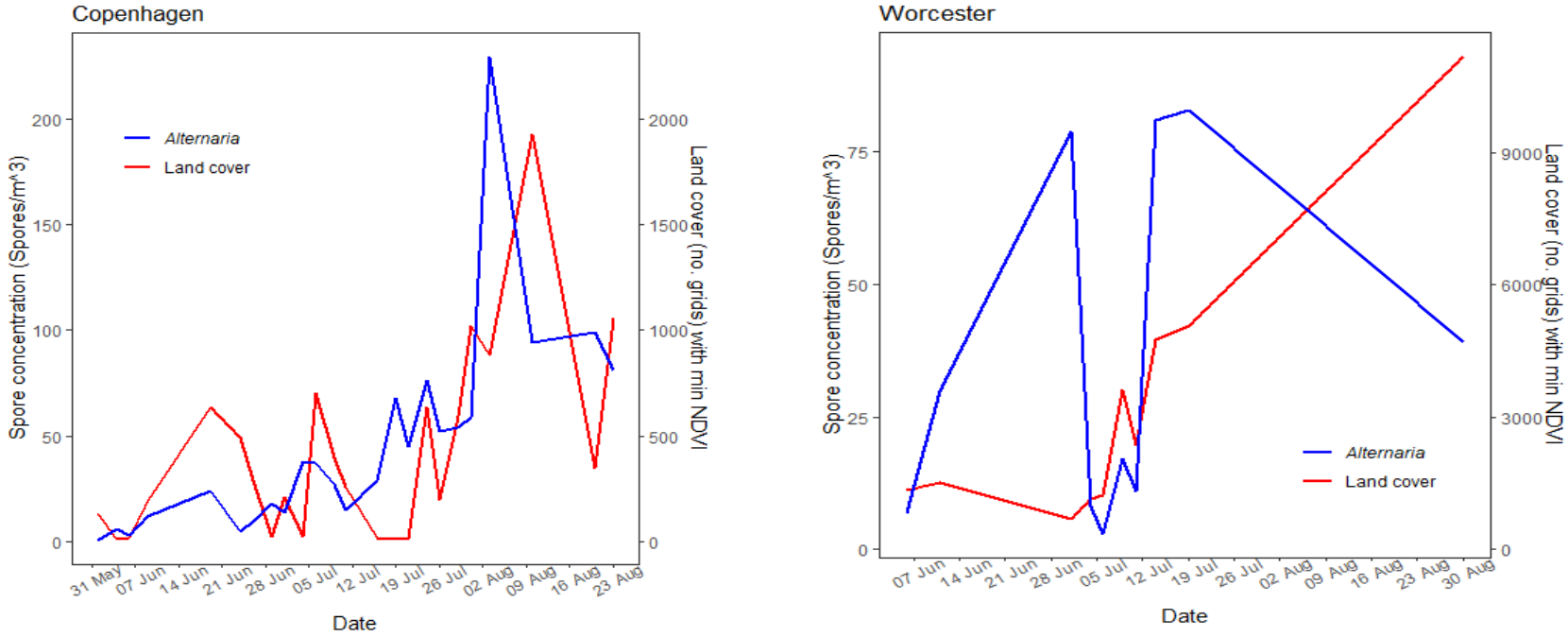

Fig. 3 Relationship between *Alternaria* spore concentrations and land cover with minimum NDVI values during cereal harvesting period (Jun-Aug 2018) at Copenhagen and Worcester.

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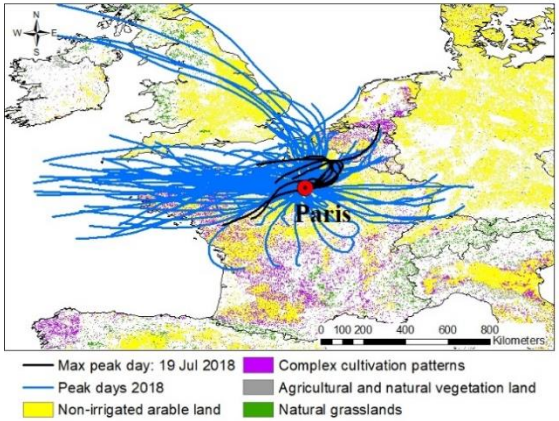
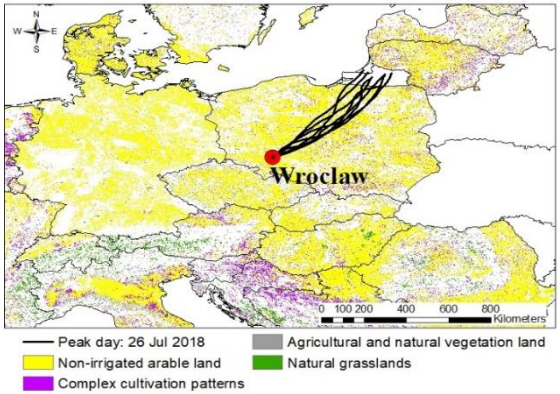
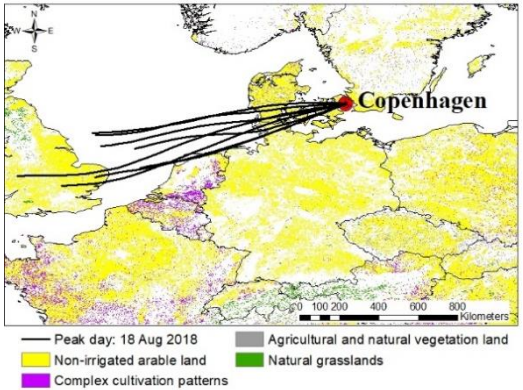
Results…







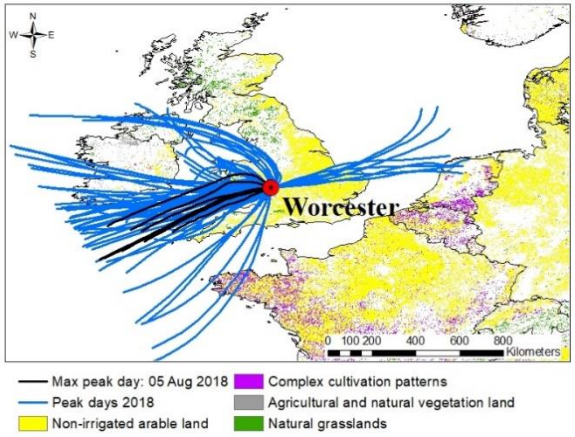


Fig. 4 Direction of air masses during peak days at Paris, Wroclaw, Copenhagen and Worcester in 2018.

- Air masses passed over arable land before reaching spore traps.
- Spore sources: cereals grown locally and remotely.

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Conclusion

- Locally and remotely grown cereals were possible sources of the peak *Alternaria* spore concentrations.
- Sentinel-2 images can be used to detect *Alternaria* peaks over large areas.
- In future, higher temporal resolution (< 3days) of sentinel-2 data will ensure near real-time information on peak days to sensitized people.

Acknowledgment

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