

Simulation of pollen concentrations over Europe in present and future climate conditions

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Thanks also to F Essl, M. Thibaudon*

The issues

How are future airborne pollen loads evolve?

What is the uncertainty of these loads?

What are the drivers of future airborne pollen loads?

What is driving the uncertainty ?

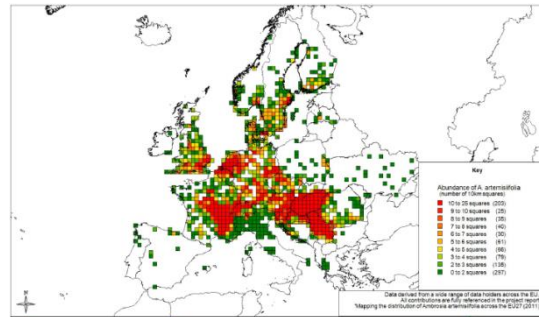
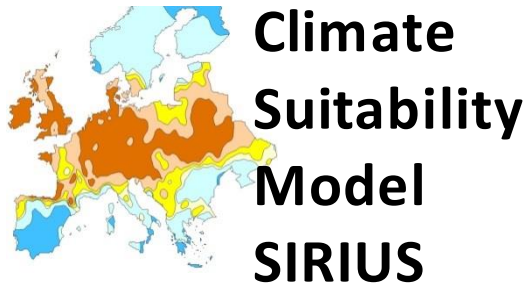
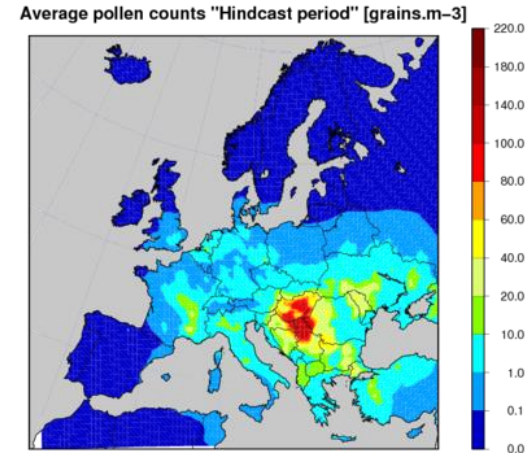
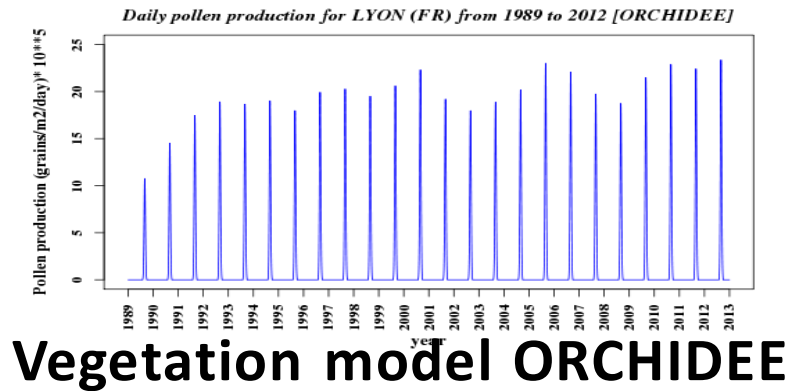
The processes involved



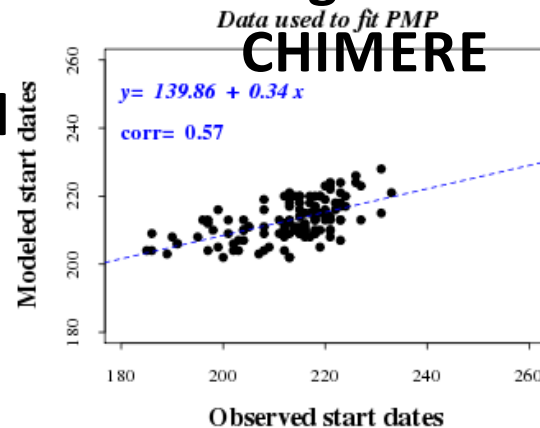
The bottlenecks

- Knowledge on plant presence and density: currently only presence but monitoring lacking, and density unavailable
- Seed diffusion mechanism
- Release mechanism largely unknown
- Phenology, production: lack of direct measurements

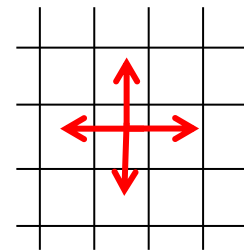
The modeling suites



2 release dispersion models: RegCM & CHIMERE



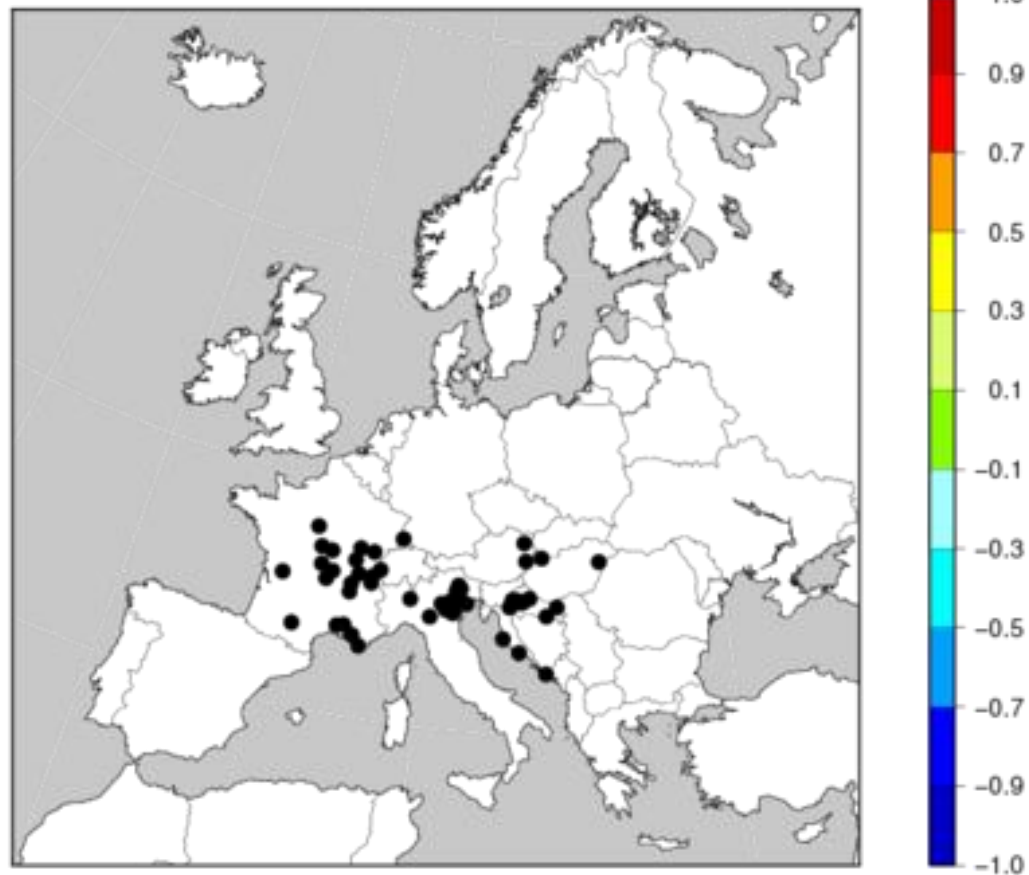
**2 Climate models
RegCM WRF
EUROCORDEX**



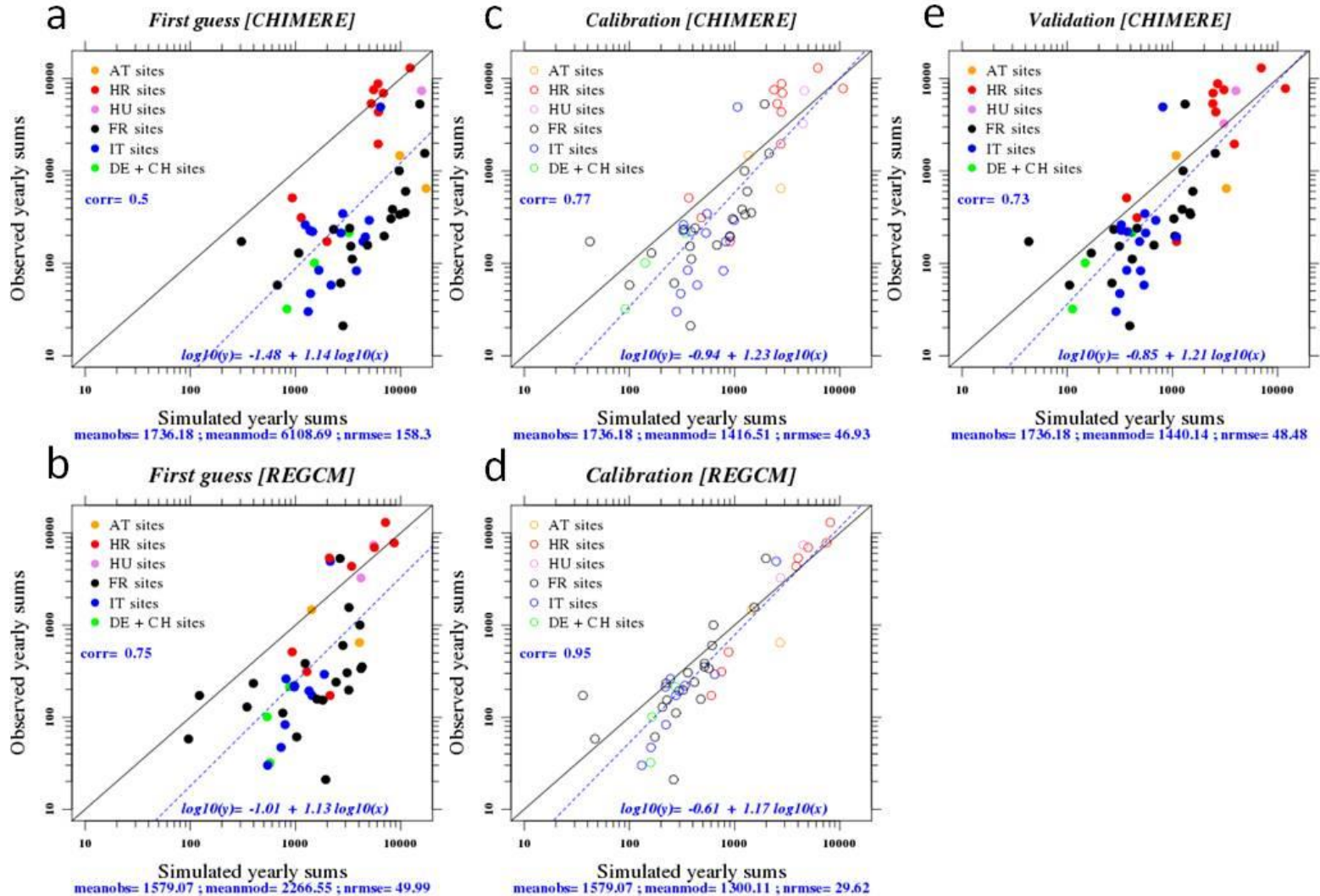
Seed diffusion

Model evaluation: sites

Observed/Simulated IAV Correlation [CHIMERE]

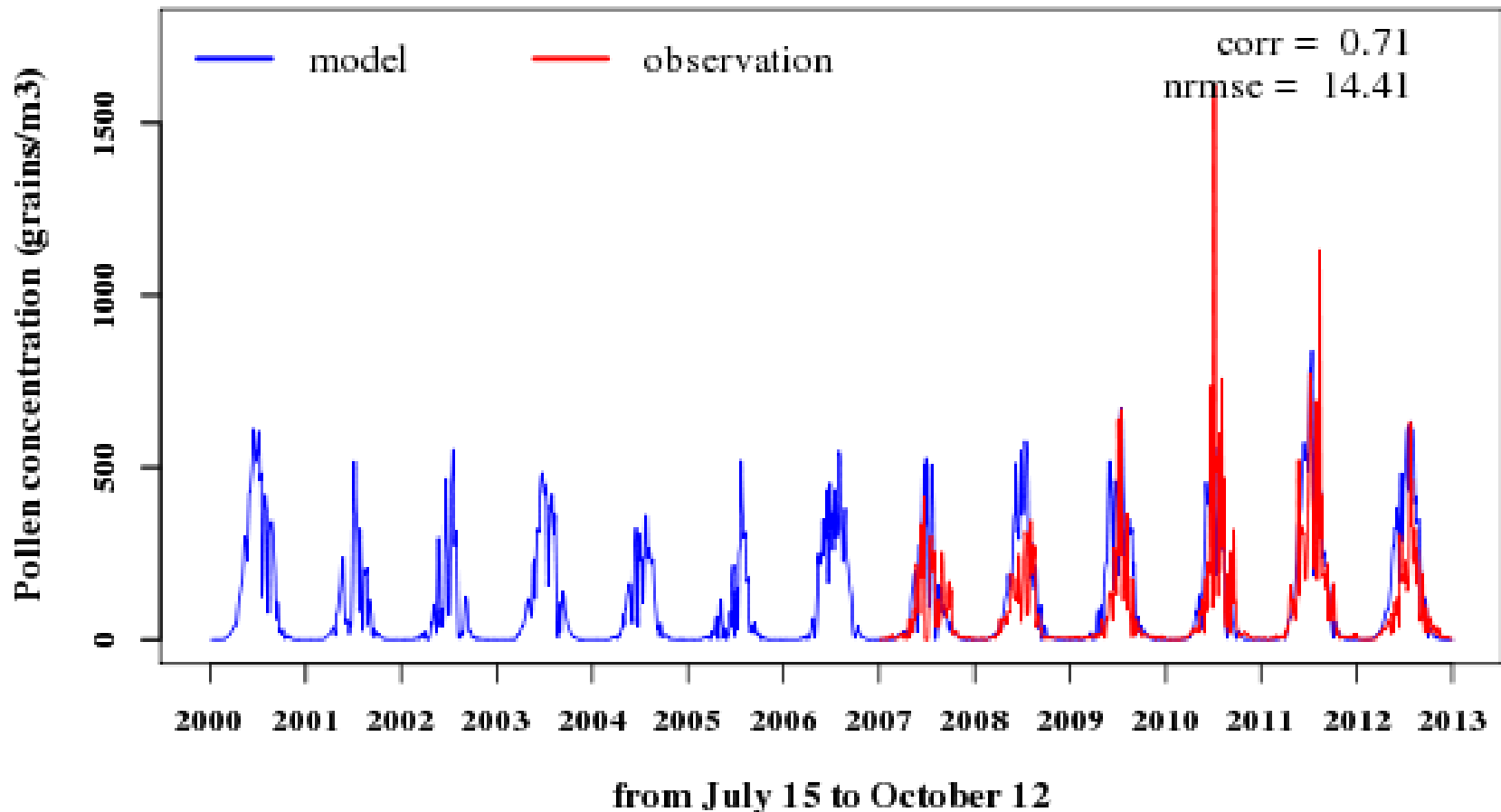


Models evaluation: means



Model evaluation: daily scale

Daily pollen concentration for Osijek [CHIMERE with modelled phenology]



Experiments

- 2 model suites
- 2 climate+LU scenarios (RCP4.5; RCP8.5)
- 3 invasion scenarios (rapid, best estimate, slow)
- Attribution experiments (with/without CC)

Conclusions

- **FUTURE AIRBORNE RAGWEED POLLENS SHOULD INCREASE A LOT IN EUROPE, ESPECIALLY IN NORTHERN/CENTRAL EUROPE**
- **REASONS: INVASION (without CC), MORE CLIMATE SUITABILITY, MORE POLLEN PRODUCTION (due to CC)**
- **LARGEST UNCERTAINTY : SEED DIFFUSION**