

A micro-ensemble of extreme precipitation climate projections for Belgium



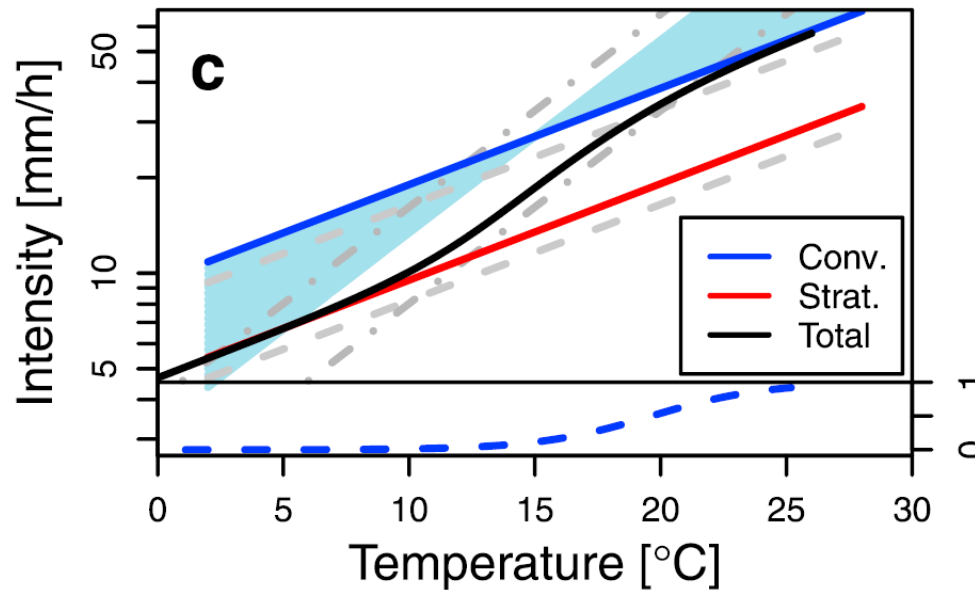
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Context: climate change

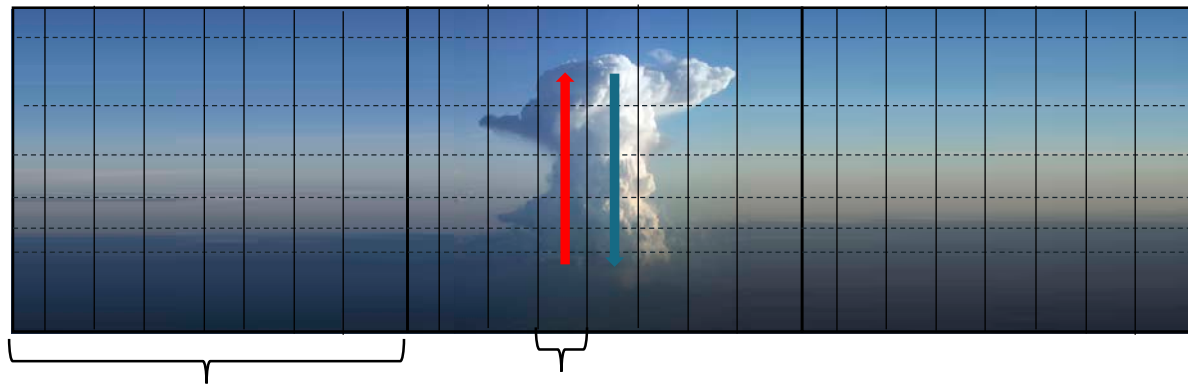


[Westra et al. 2014]

- Increase in frequency and intensity extreme events
- Local impact! → High resolution spatial information needed

Theoretical advantage of CPMs

1) Omitting error-prone convective parameterizations

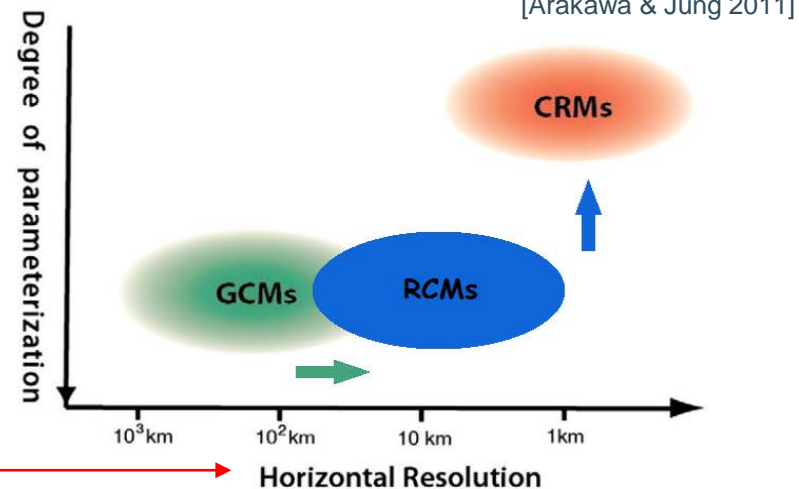


> 10 km

< 4 km

*Deep moist convection
explicitly simulated*

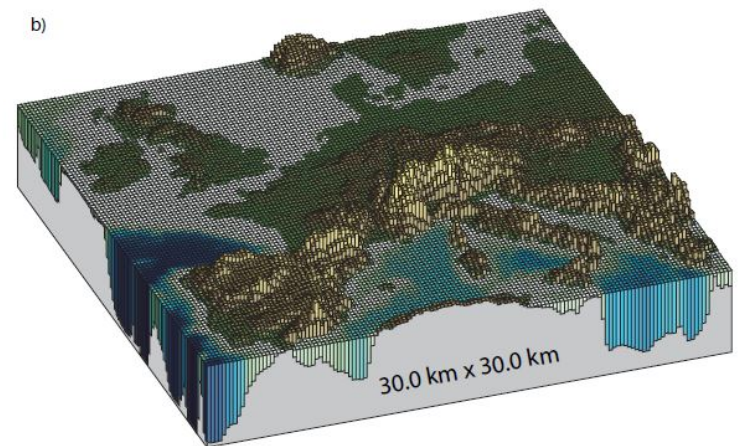
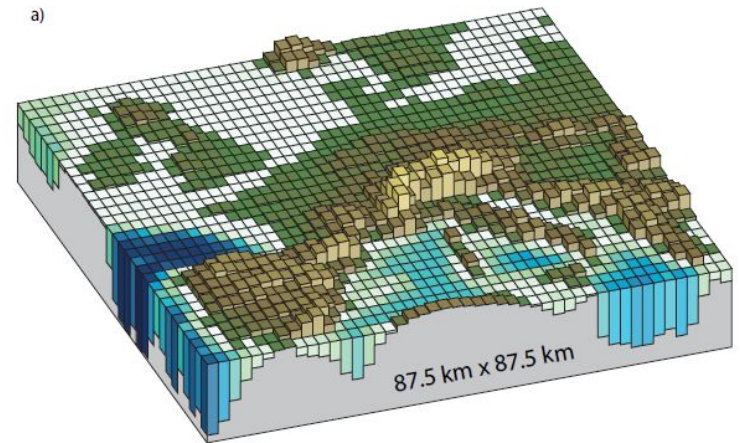
*Moist convection
highly parameterized*



Theoretical advantage of CPMs

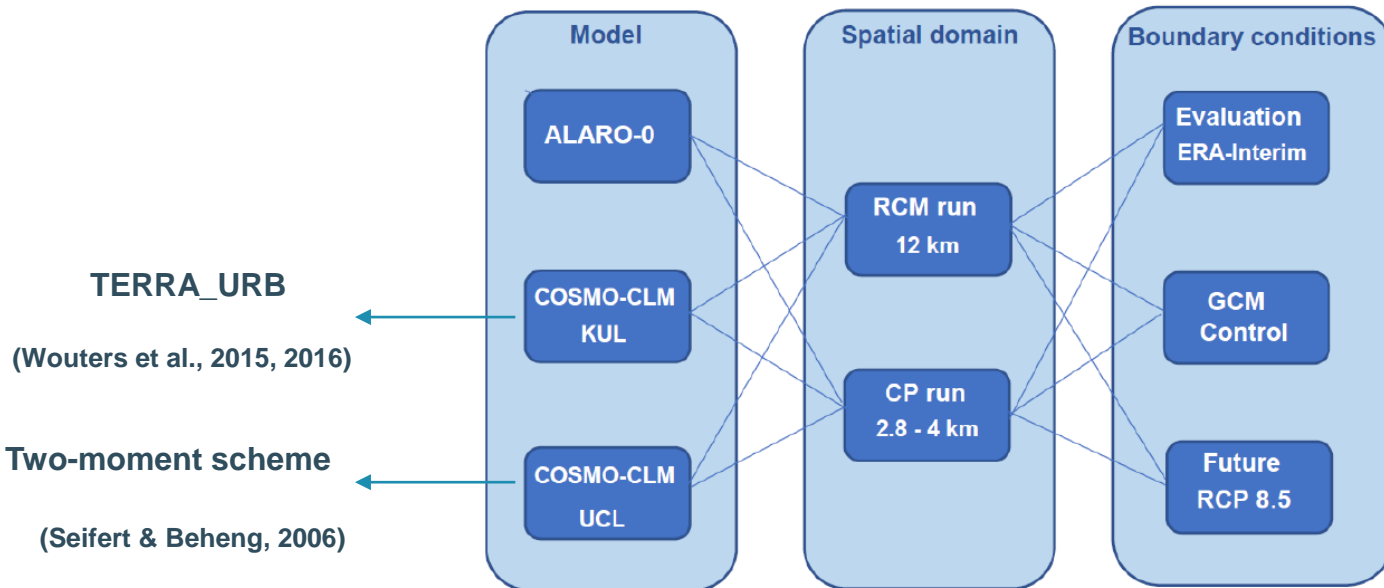
2) Improved representation of **orography** and surface fields

(e.g. coastlines, lakes, forestry, soil characteristics, urbanization...)



[Cubasch et al. 2013]

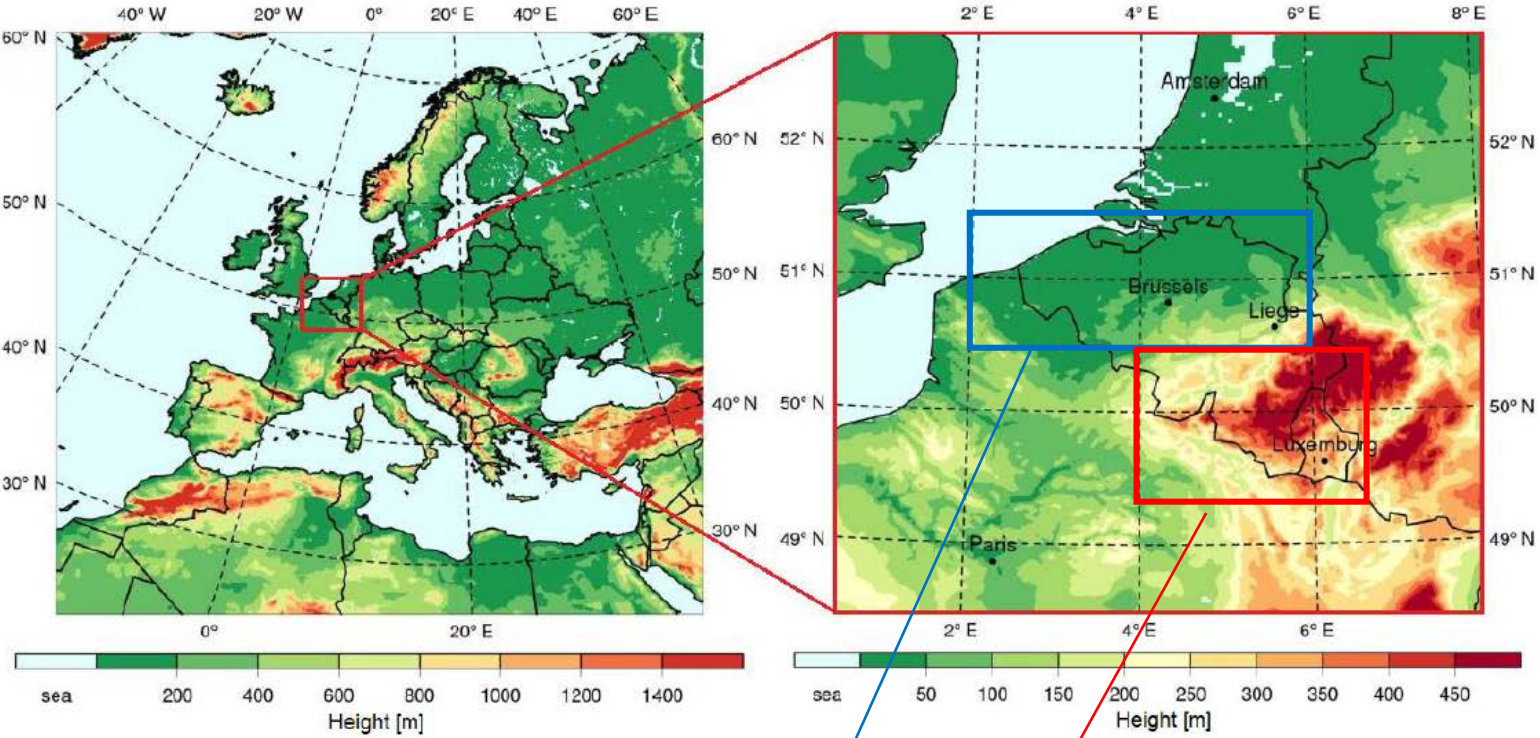
Framework and data



[Termonia et al. 2018]



Study domain



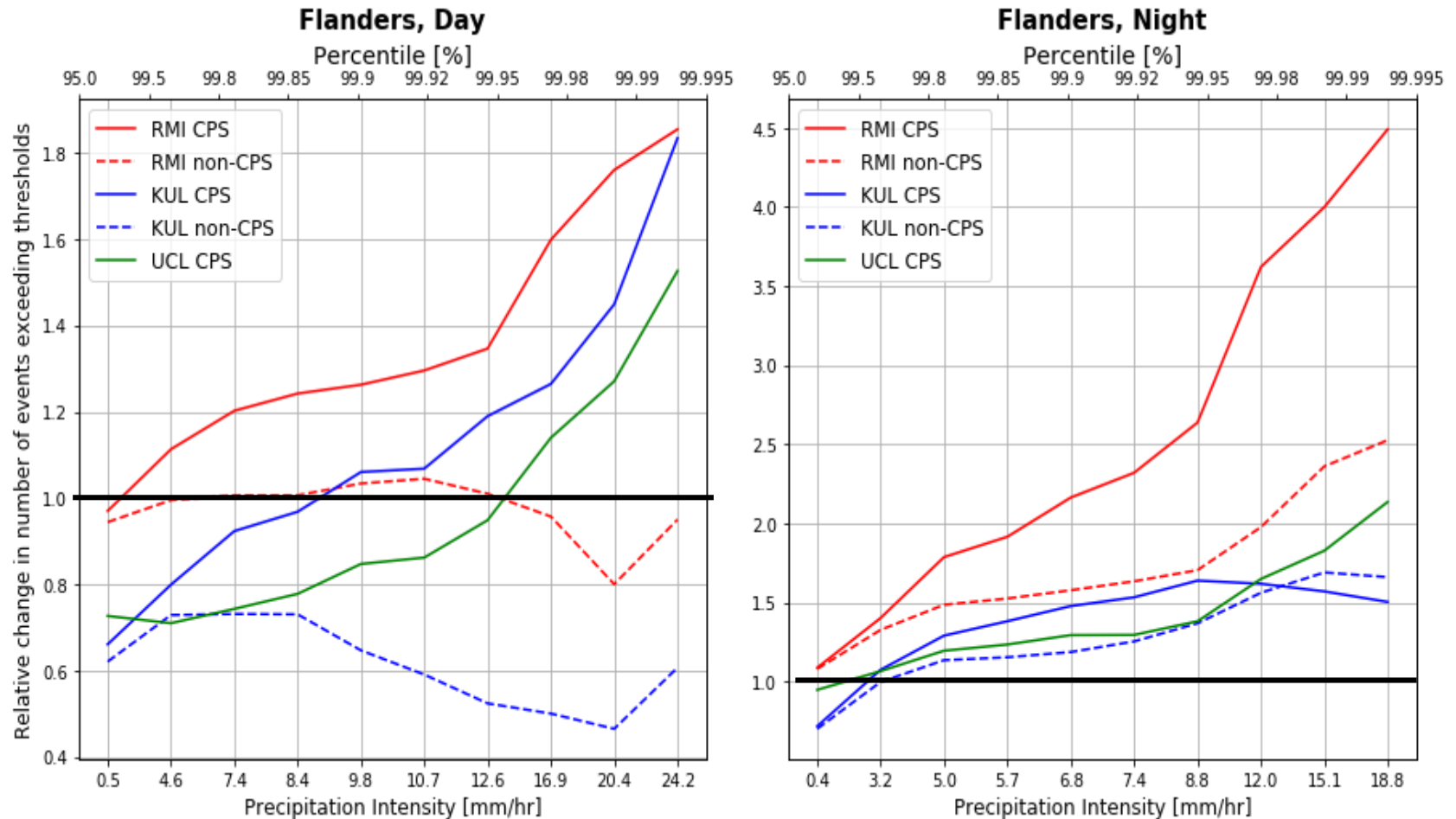
Flanders

Ardennes

[Vanden Broucke et al. 2018]

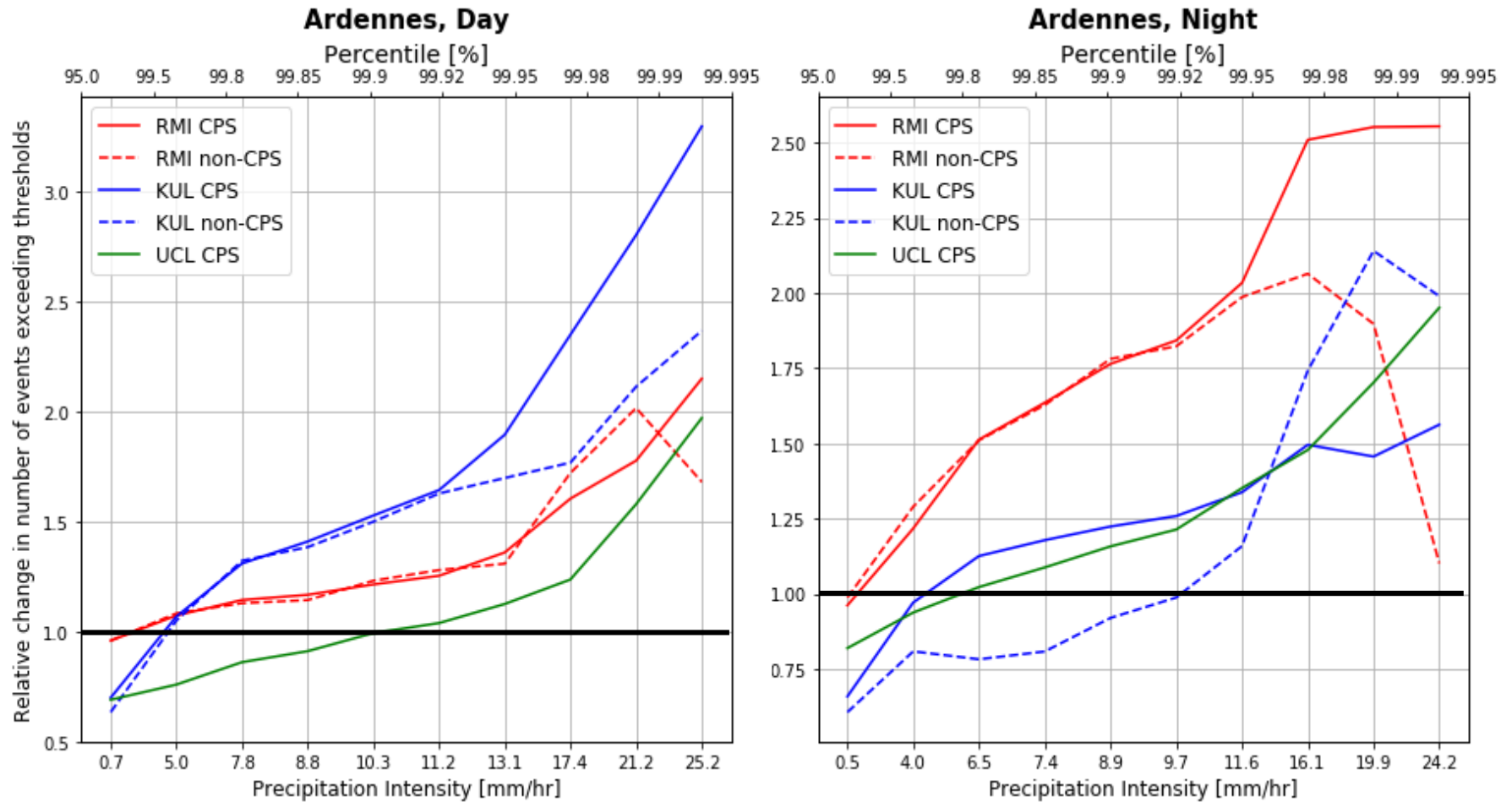
Results

Change in Summer Extreme Precipitation [RCP 8.5 2070-2100]



Results

Change in Summer Extreme Precipitation [RCP 8.5 2070-2100]

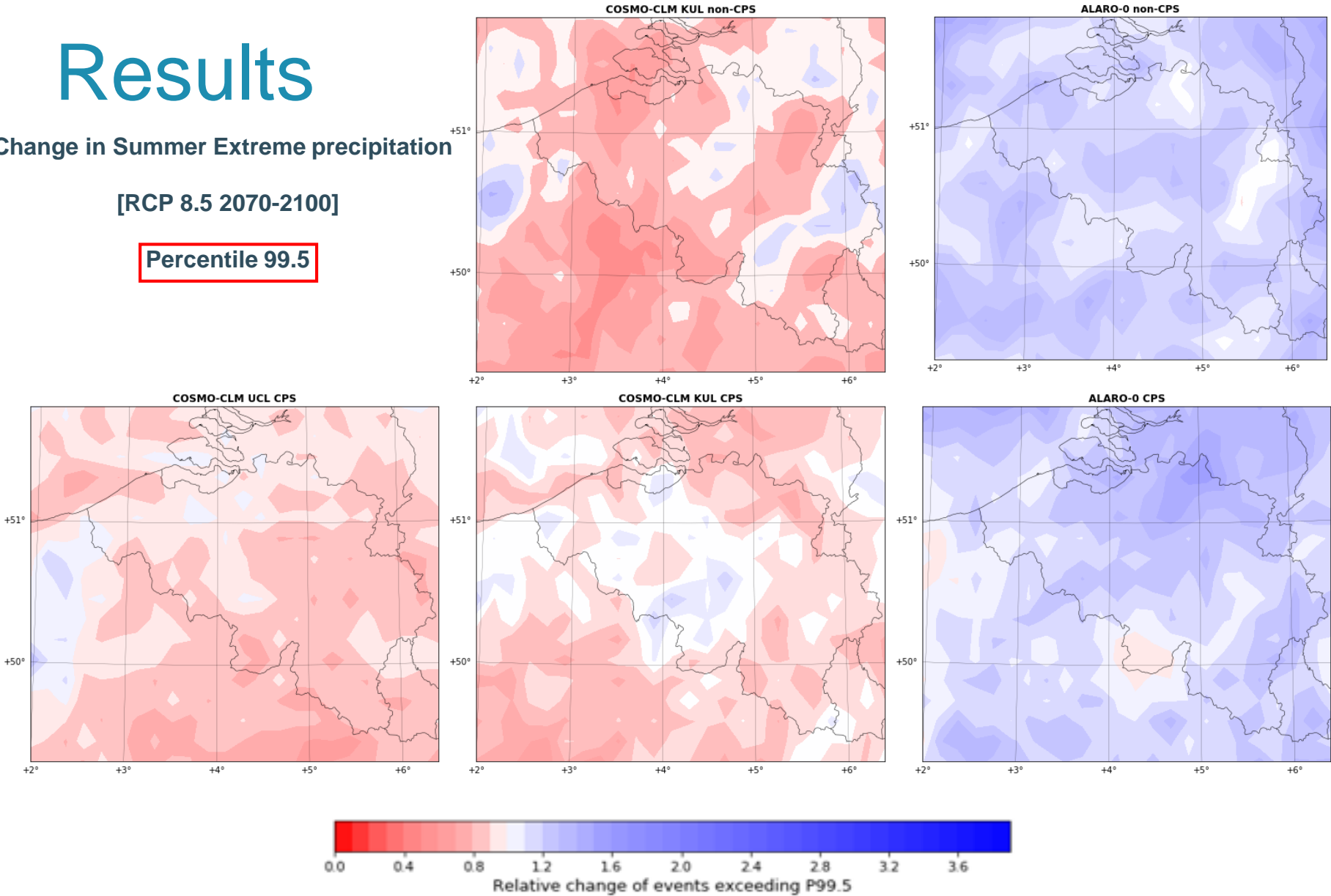


Results

Change in Summer Extreme precipitation

[RCP 8.5 2070-2100]

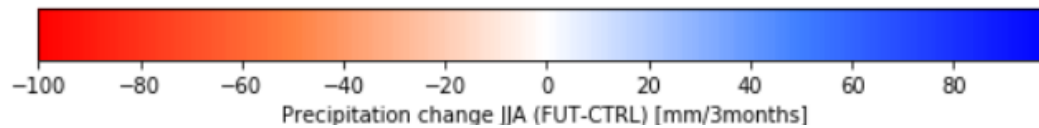
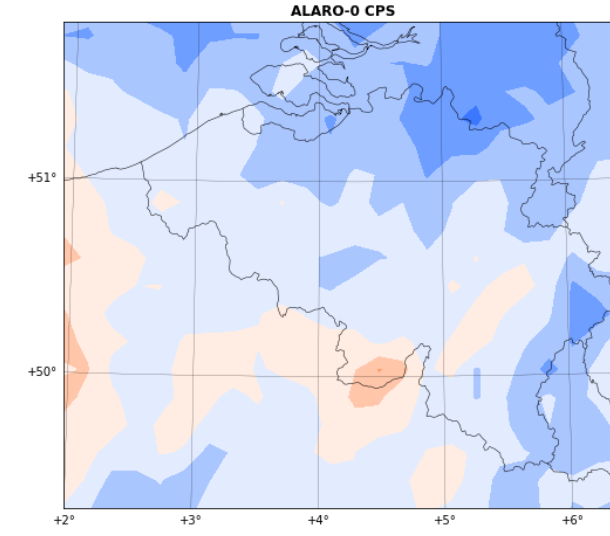
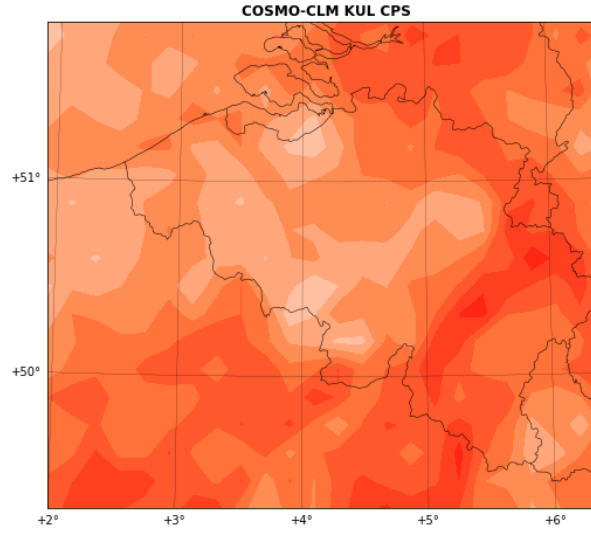
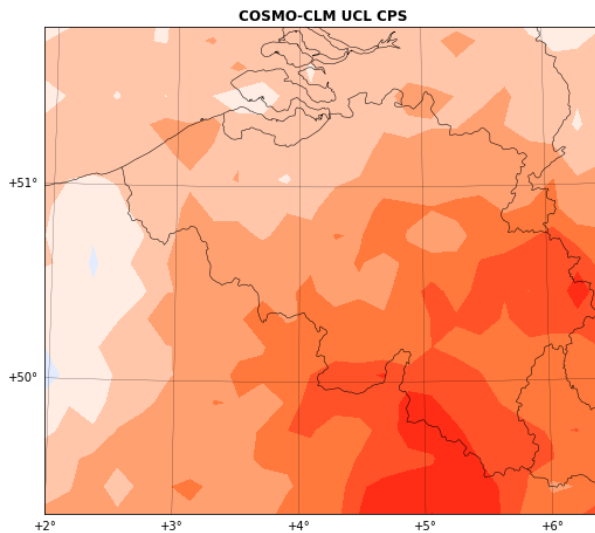
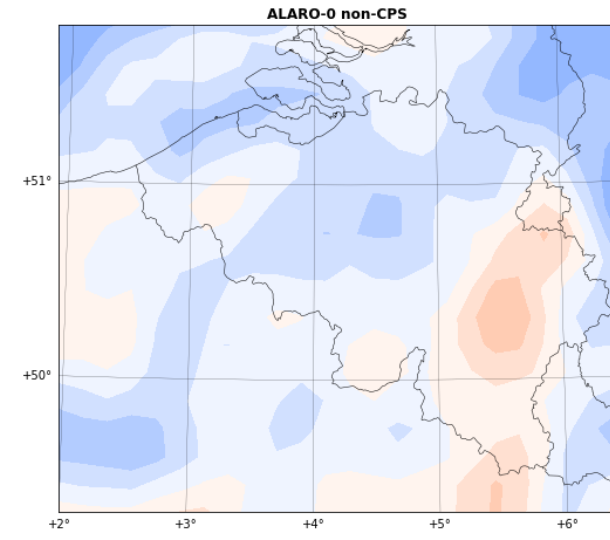
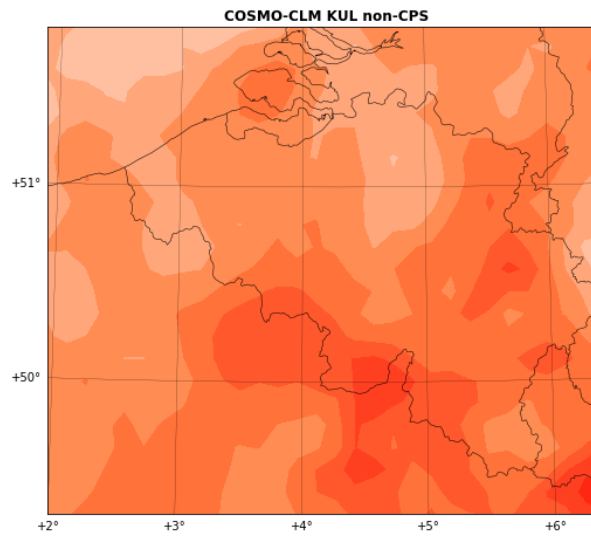
Percentile 99.5



Results

Change in mean Summer Precipitation

[RCP 8.5 2070-2100]

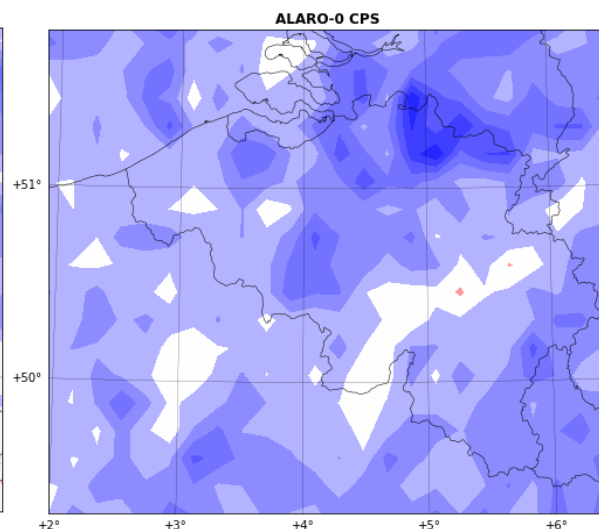
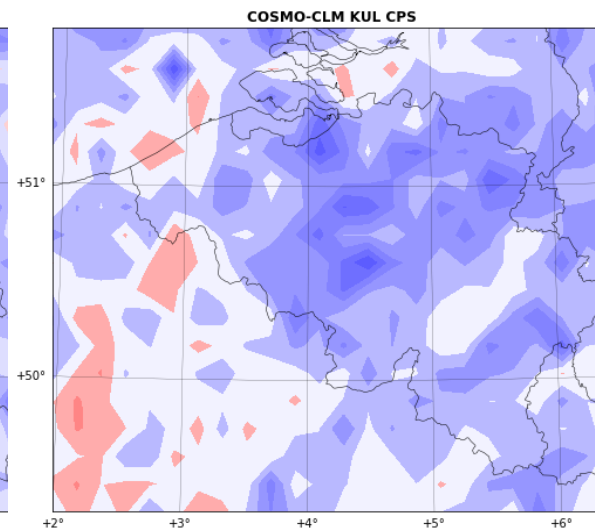
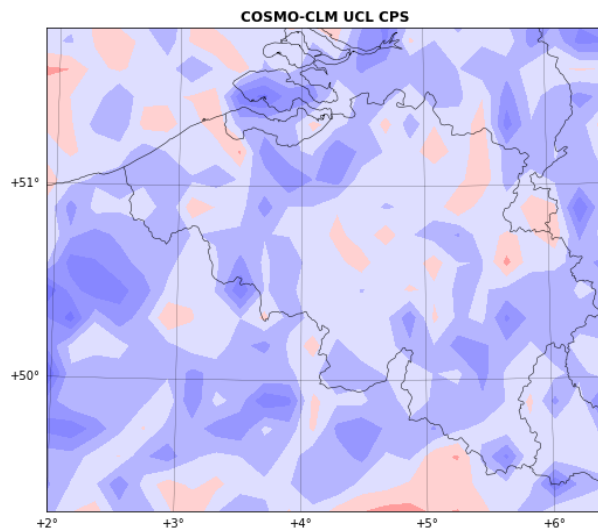
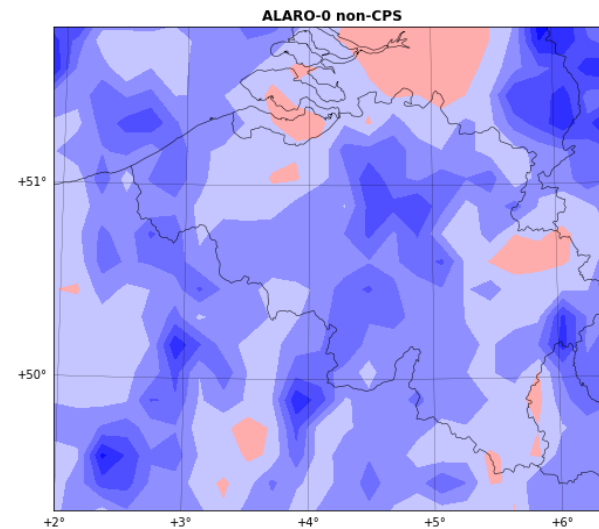
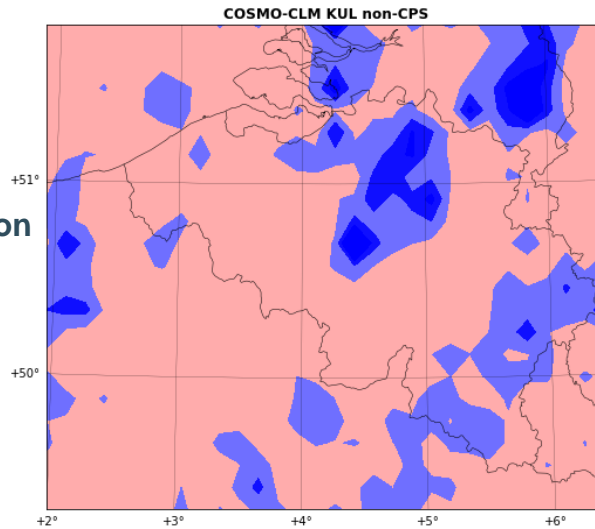


Results

Change in Summer Extreme precipitation

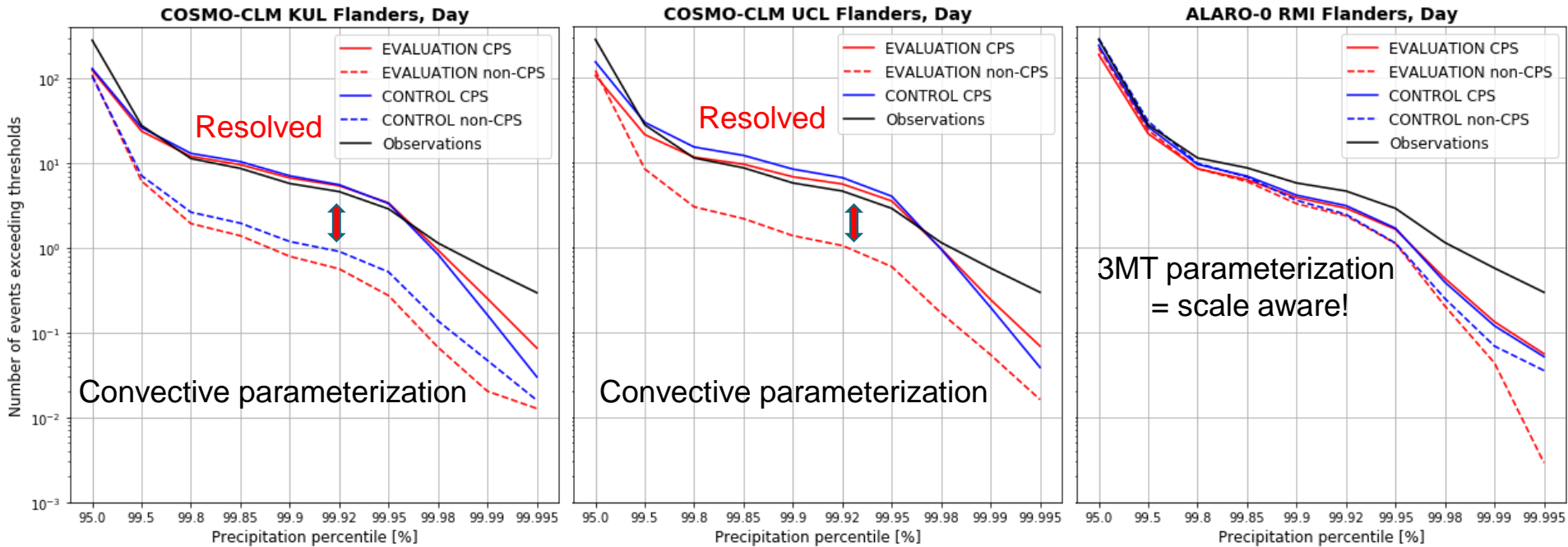
[RCP 8.5 2070-2100]

Percentile 99.95



Results

Model evaluation present-day climate [1979-2010]



Discussion/conclusions

- ROBUST trends in ensemble
 - Resolution/topographic dependency
 - Intensity dependency
- CC signal independent on climate model
- Model differences?
 - General circulation patterns
 - Different parameterization mechanisms



Questions?



Thank you!