

The Flagship Pilot Study on Convection over Europe and the Mediterranean

A year three update

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Convection team [30+ institutions!]*

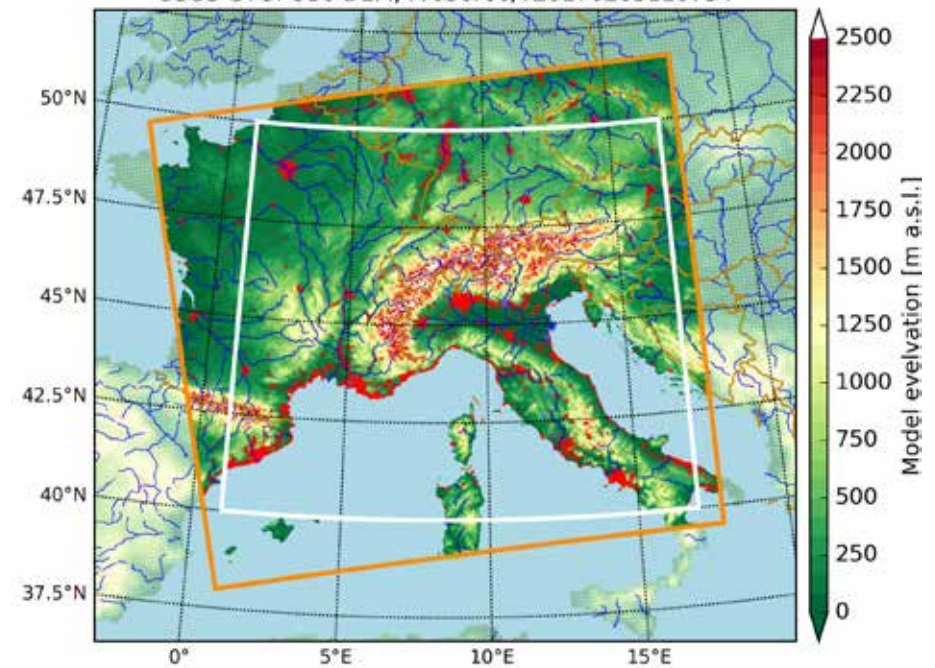
15 OCTOBER, ICRC-CORDEX, BEIJING CHINA

Outline



- Motivation & Objectives
- Status
- Results
 - Process-based metrics
 - Test Cases/ensemble performance
- Challenges
- Next Steps

WRF v3.8.1 model topography, CORDEX FPS CPCS Alps3km grid, 0.11deg
USGS GTOPO30 DEM, rv050r00/v20170203110734



Motivation & Objectives



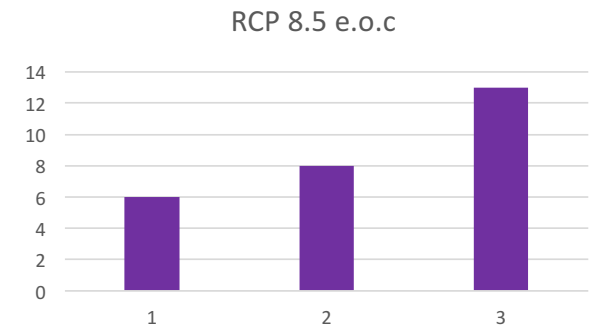
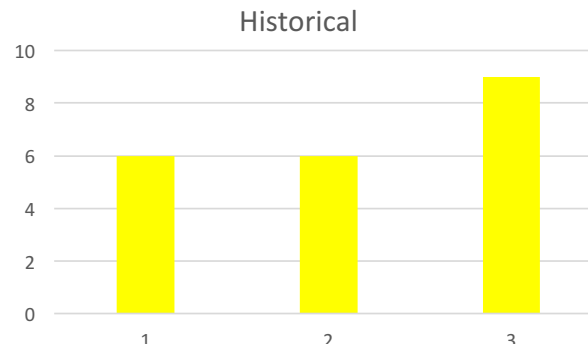
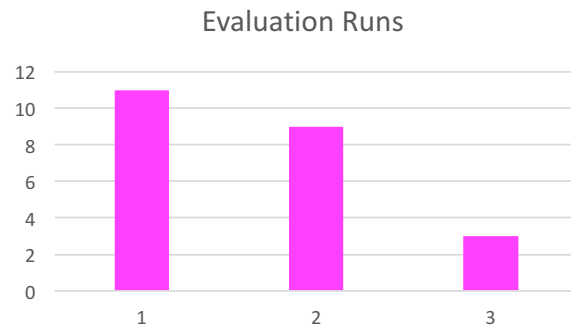
- **Investigate convective-scale events, related processes and their changes** in a few key regions of Europe and the Mediterranean using convection-permitting RCMs, statistical models and available observations
- **Provide a collective multi-model ensemble assessment and intercomparison** our modeling capacity at convection-permitting scale
- **Shape a coherent and robust assessment of the consequences of climate change on convective phenomena impacts at local to regional scales**



Foto: Audun Braastad / NTB scanpix



Status of 10-year time slices

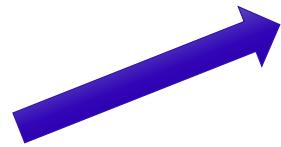


- X-axis shows status
 - 1 = finished/published
 - 2 = running
 - 3 = planned
- Y-axis shows number of simulations



Results: Test cases (Coppola et al. 2018)

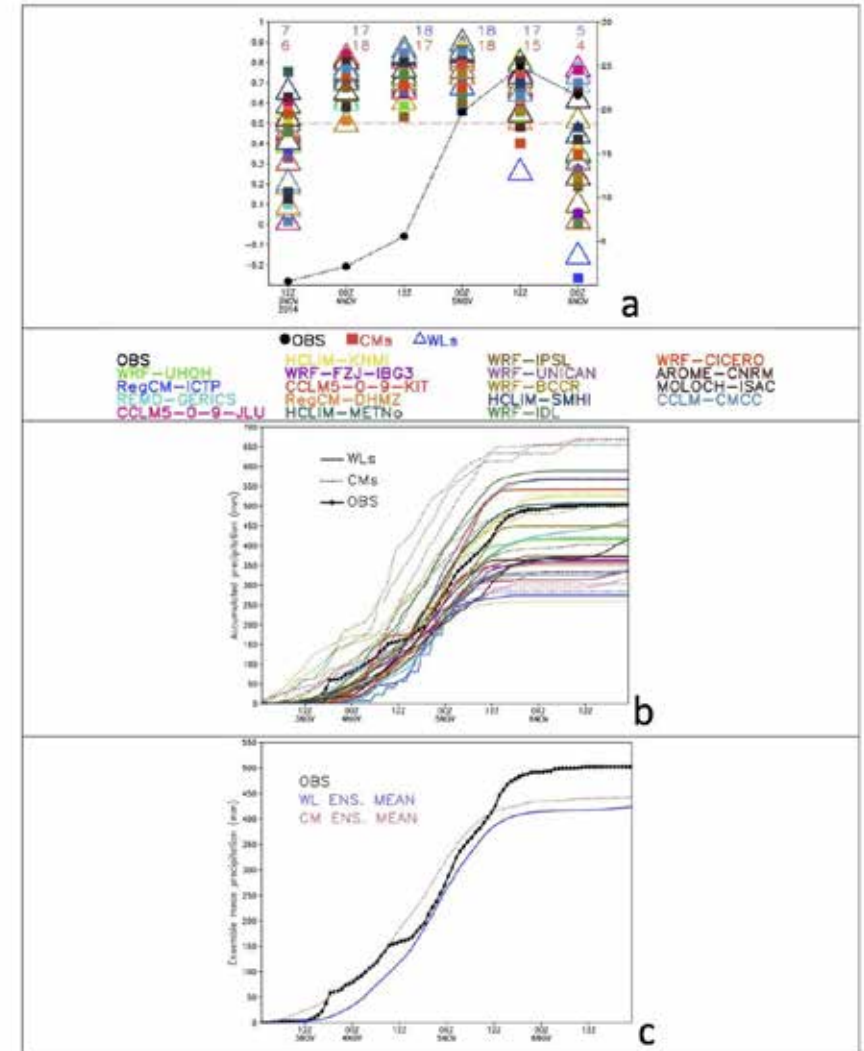
Spatial pattern correlation high throughout; tight spread



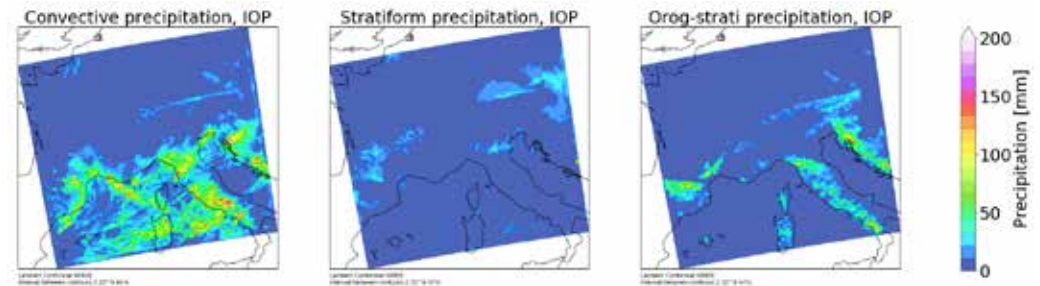
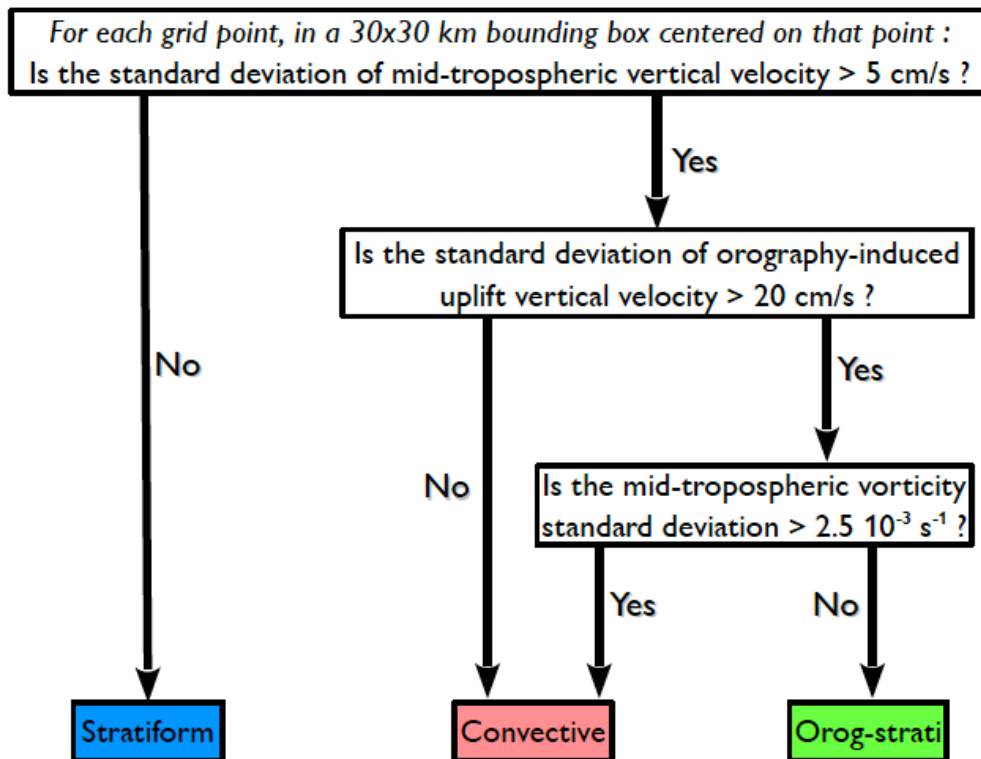
Event well captured in both modes



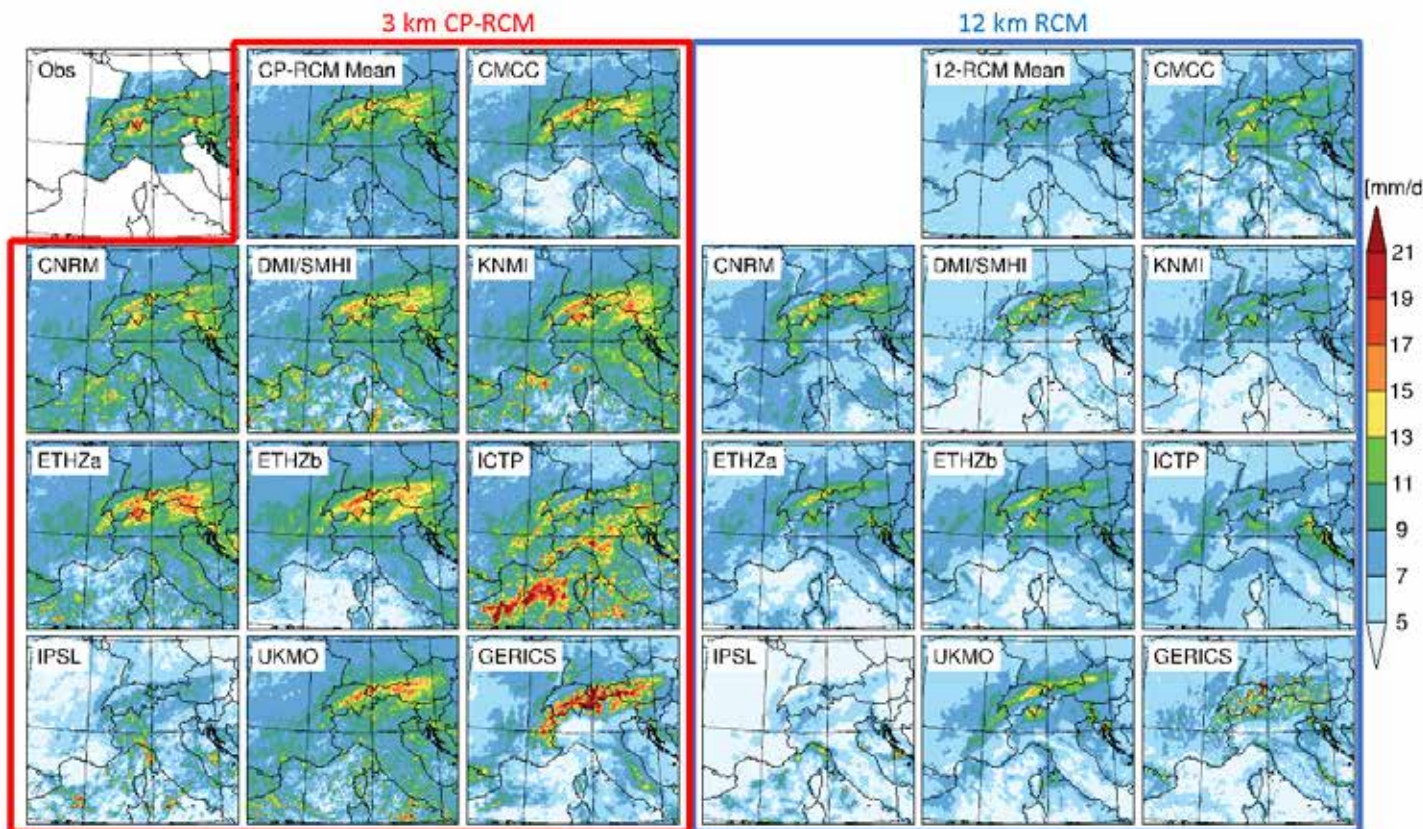
Ensemble mean for both modes tracks obs well



Results: new methods for precipitation classification in CPM simulations

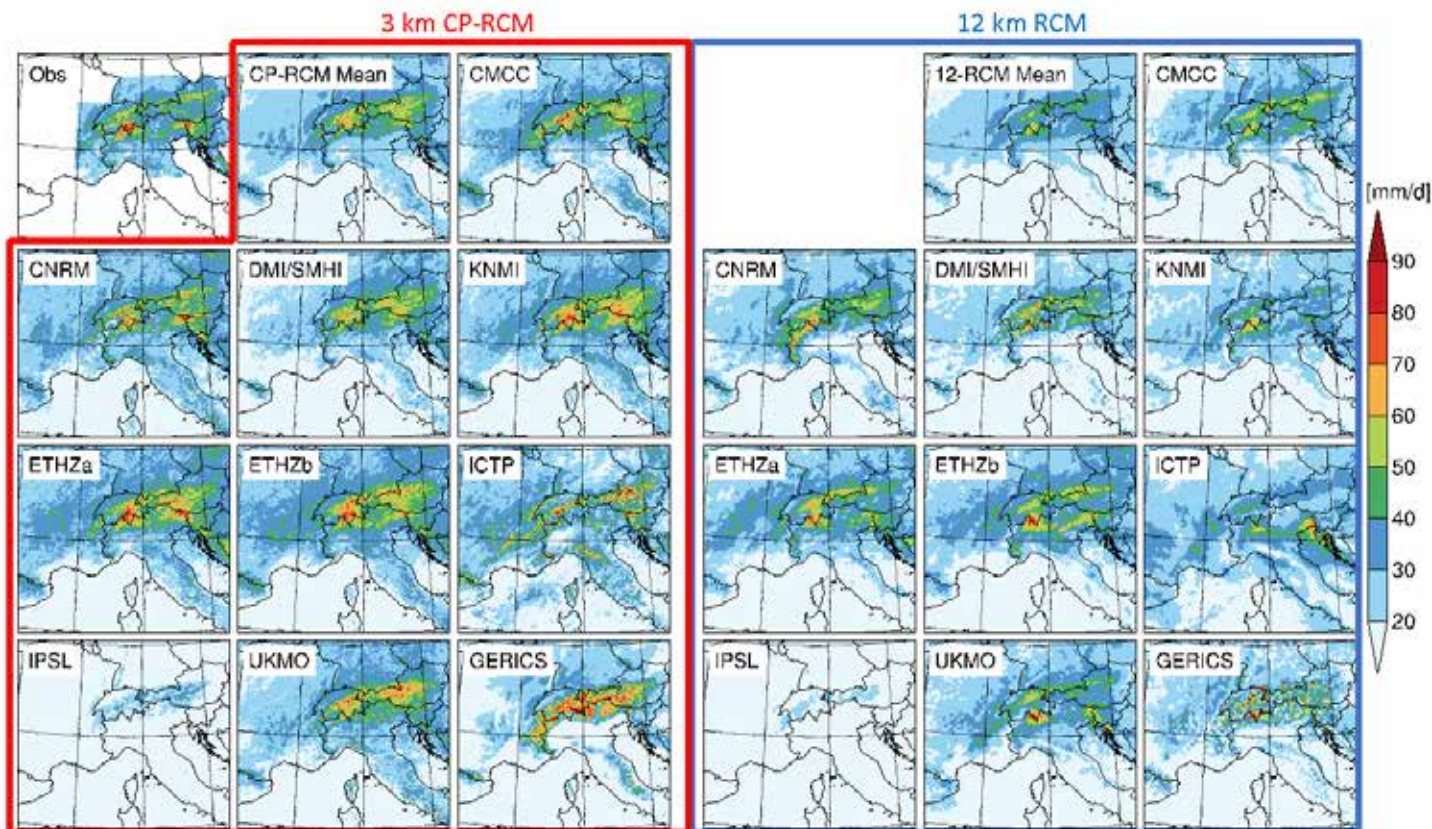


Results: Evaluation Runs EUCP sub-set (Ban et al. 2019)



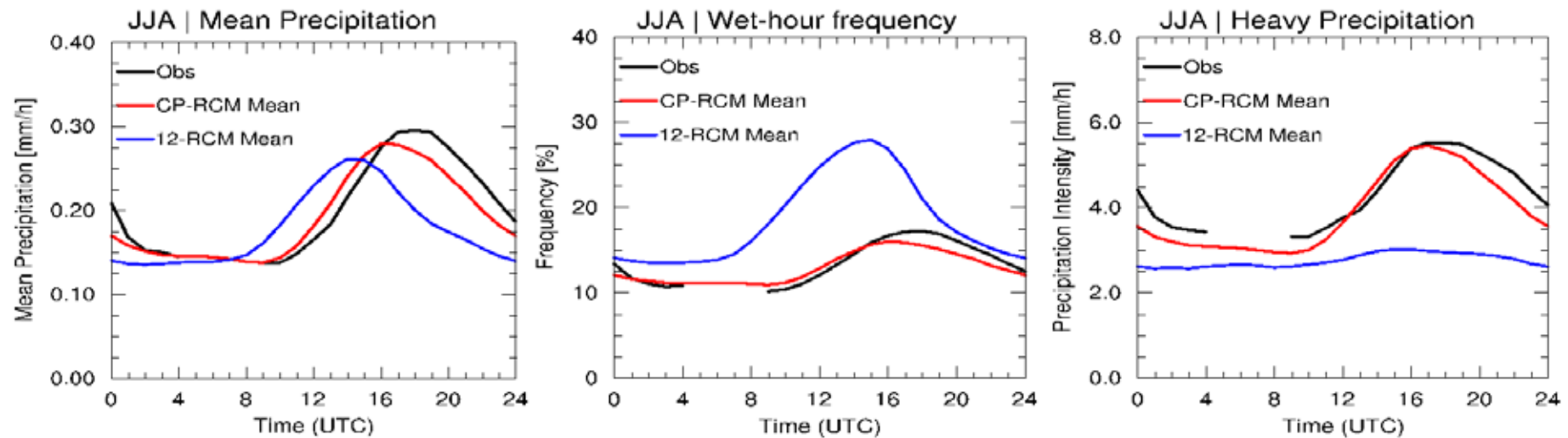
- Intensity of summer daily precipitation shows clear improvements at 3km vs. 12km

Results: Evaluation Runs EUCP sub-set (Ban et al. 2019)



- Heavy daily precipitation shows clear improvement
- But also large intermodel spread
- Emphasizes need for ensembles

Results: Evaluation Runs EUCP sub-set (Ban et al. 2019)



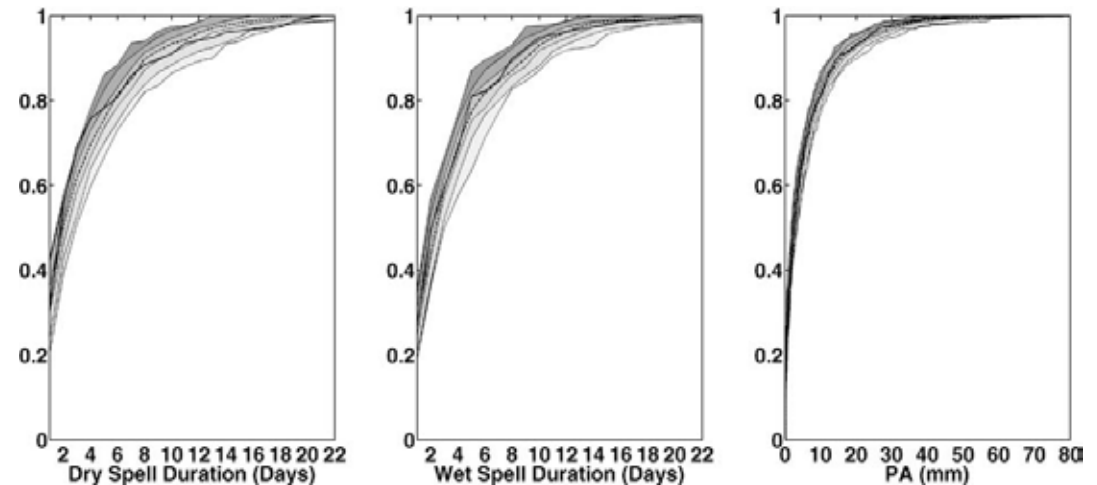
- Clear improvement in diurnal cycles



Challenges & Opportunities



- Wither statistical emulators?
 - Come to session D6 on Thursday 1400!
- Time: Only 2 more years! But now we move to analysis; Opportunity!
- Data handling: Where/how to analyze mountains of data?
- Funding: CORDEX and WCRP need to advocate for regional climate and regional downscaling



Weather generators can potentially be used to produce high temporal and spatial resolution data from after training on daily fields

Source: Mezghani & Hingray (2009)
DOI: 10.1016/j.jhydrol.2009.08.033



Next steps: 2020 and beyond

- Finish runs
- Research, research, research
- Publish, publish, publish
- Link up to other FPSs
- Plan for end of project
 - Publishing to ESGF
 - Linking to CORDEX future strategy

NORCE



WCRP
CORDEX
FLAGSHIP PILOT STUDIES

Thank you!



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