

# CORDEX-FPS: Convective Phenomena over Europe and the Mediterranean

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The CORDEX-FPS on Convective Phenomena over Europe and the Mediterranean aims to produce and investigate a first-of-its-kind ensemble of convection permitting simulations. There are over 67 individual participants representing 16 modeling groups and 5 non-hydrostatic regional climate models. The fourth annual meeting was held November 26-27, 2019 in conjunction with the annual Med-CORDEX and FPS-aerosols and FPS- meetings. Our host was Samuel Somot and the meeting was held at Meteo France in Toulouse.

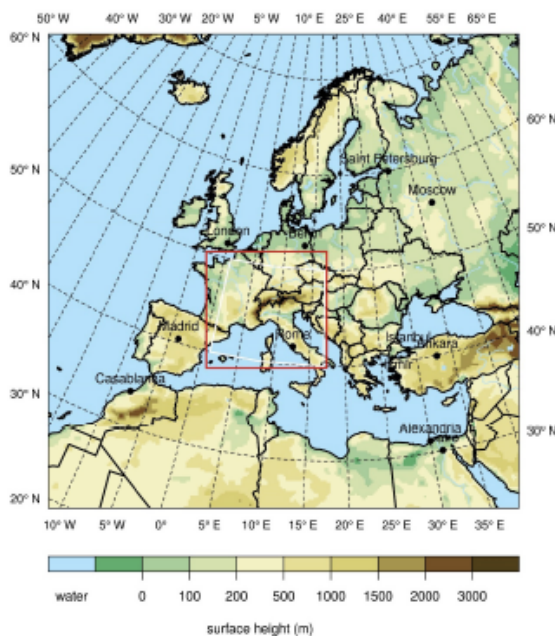
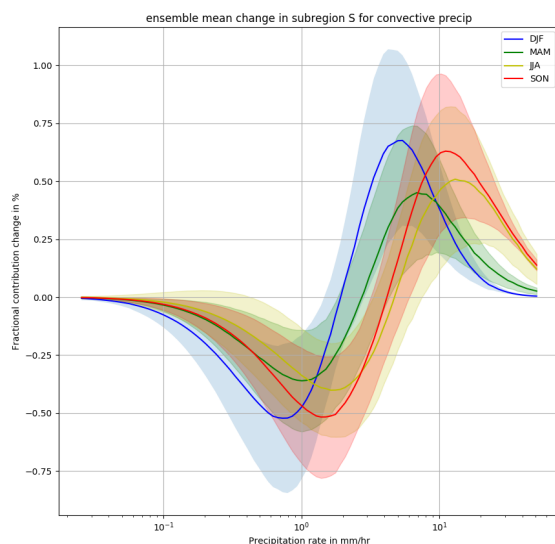


Figure: Illustration of location of FPS convection mandatory domain (red box). The actual region (1E – 17E; 40N – 50N) for final analyses is shown by the white box.



2019 witnessed a truly impressive effort as over 22 evaluation time slices and 12 scenario simulations (present and future) were completed in time for the first manuscripts on the climate ensemble to be submitted prior to the IPCC deadline of 31.12.2019. In addition to this activity participants continued to analyze the output from their simulations and deliver new insights, well beyond the canonical precipitation analyses. For example, see the figure at left which shows the strong shift towards higher convective precipitation intensities in the future, especially in summer (red curve, Sobolowski et al., in-prep). The consortium was active as usual at EGU and EMS. In addition, the project was presented at ICRC in Beijing, China in October along with many other contributions from the FPS. See references for details.

During the 2019 annual meeting an entire day was set aside for scientific presentations and discussions. There were a total of **16** talks on a wide range of topics from statistical emulators to big data analytics to scenario assessments. Yet again, most impressive was how the investigations have moved beyond analyses of the canonical surface fields to other aspects of the climate system.

Documentation of the models metadata and status of simulations is currently freely available to all via google spreadsheets. The

aim is to make model configuration as transparent as possible. Likewise the status of the runs should also be readily available.

Simulations:

[https://drive.google.com/open?id=1d8\\_bR7pc\\_2LIVFB9fRbs95t109sip6k-1wz-FThM5Wc](https://drive.google.com/open?id=1d8_bR7pc_2LIVFB9fRbs95t109sip6k-1wz-FThM5Wc)

Metadata:

[https://drive.google.com/open?id=1q5SnLtetg6UvNhQRR1\\_iJEldKk4D3NDaP4tWWyH92qc](https://drive.google.com/open?id=1q5SnLtetg6UvNhQRR1_iJEldKk4D3NDaP4tWWyH92qc)

Discussions have continued on how eventually deliver the FPS simulations on the ESGF. A file/directory naming convention has been agreed to in principle and is available on the wiki. However, there is a need for fine tuning along with the other FPSs and, most importantly ESGF representatives. There is currently a task group working on this issue.

### Plans for 2020

- Groups continue to perform simulations for historical and future time slices with aim for full ensemble to be finished by end of 2020 (excluding re-runs).
- Finalize, in collaboration with CORDEX-SAT (Grigory Nikulin) and other FPSs, naming conventions and new Data Reference Syntax required for making simulations available via the ESGF. This process is ongoing with representatives from ESGF community at DKRZ (Martina Stockhouse). Goal is to have a final set of guidelines and recommendations by end of 2020.
- Continue to perform analyses, write and submit community papers. A number are ongoing (precipitation characteristics, hazards, added value, etc.) and will be submitted this year.
- All other groups aim to finish the evaluation runs and scenario runs by year's end

### Selected References

Anders, I. et al., (2019) Influence of spectral nudging on convection permitting simulations. Latsis Symposium on High Resolutions Climate Modelling; August 21-23, Zurich, Switzerland.

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Pichelli et al., (in review) The first multi-model ensemble of regional climate simulations at kilometer-scale resolution part 2: future precipitation projections. *Climate Dynamics*.

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Soares, P.M.M. and R. Cardoso (2019) On the added value of regional climate and convective permitting simulations performed in the framework of EURO-CORDEX. Geophysical Research Abstracts Vol. 21, EGU2019-16481, 2019 EGU General Assembly 2019.

Stocchi, P. et al. (2019) Evaluation of the convection resolving climate modeling simulations over different European regions. Geophysical Research Abstracts Vol. 21, EGU2019-14724, 2019 EGU General Assembly 2019.

Truhetz, H. and K. Görgen (2019) Effects of a shallow convection scheme in perennial convection permitting CORDEX-FPS WRF simulations. Latsis Symposium on High Resolutions Climate Modelling; August 21-23, Zurich, Switzerland.