



Climate Change

Evaluation of the precipitation climate in E-OBS and ERA5 with high-resolution grid datasets in European regions



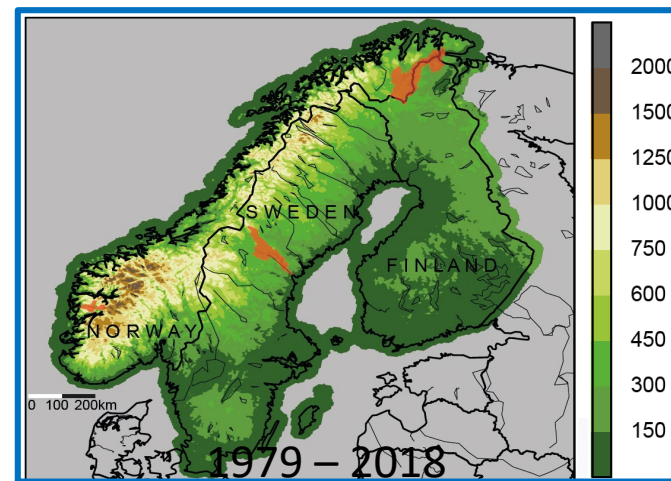
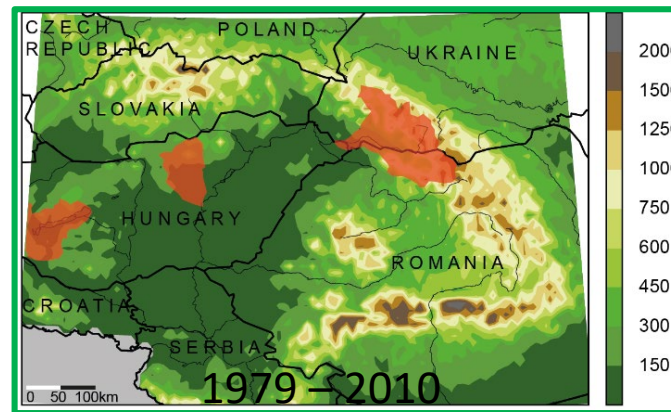
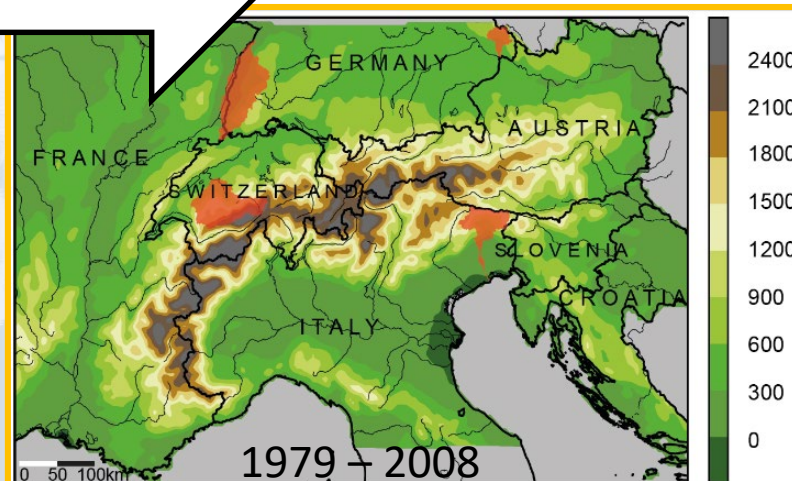


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1. Datasets

Test datasets	Reference datasets
E-OBS (v19.0e)	CARPATCLIM
ERA5	NGCD-1
	NGCD-2
	APGD

0.1° (~10 km)





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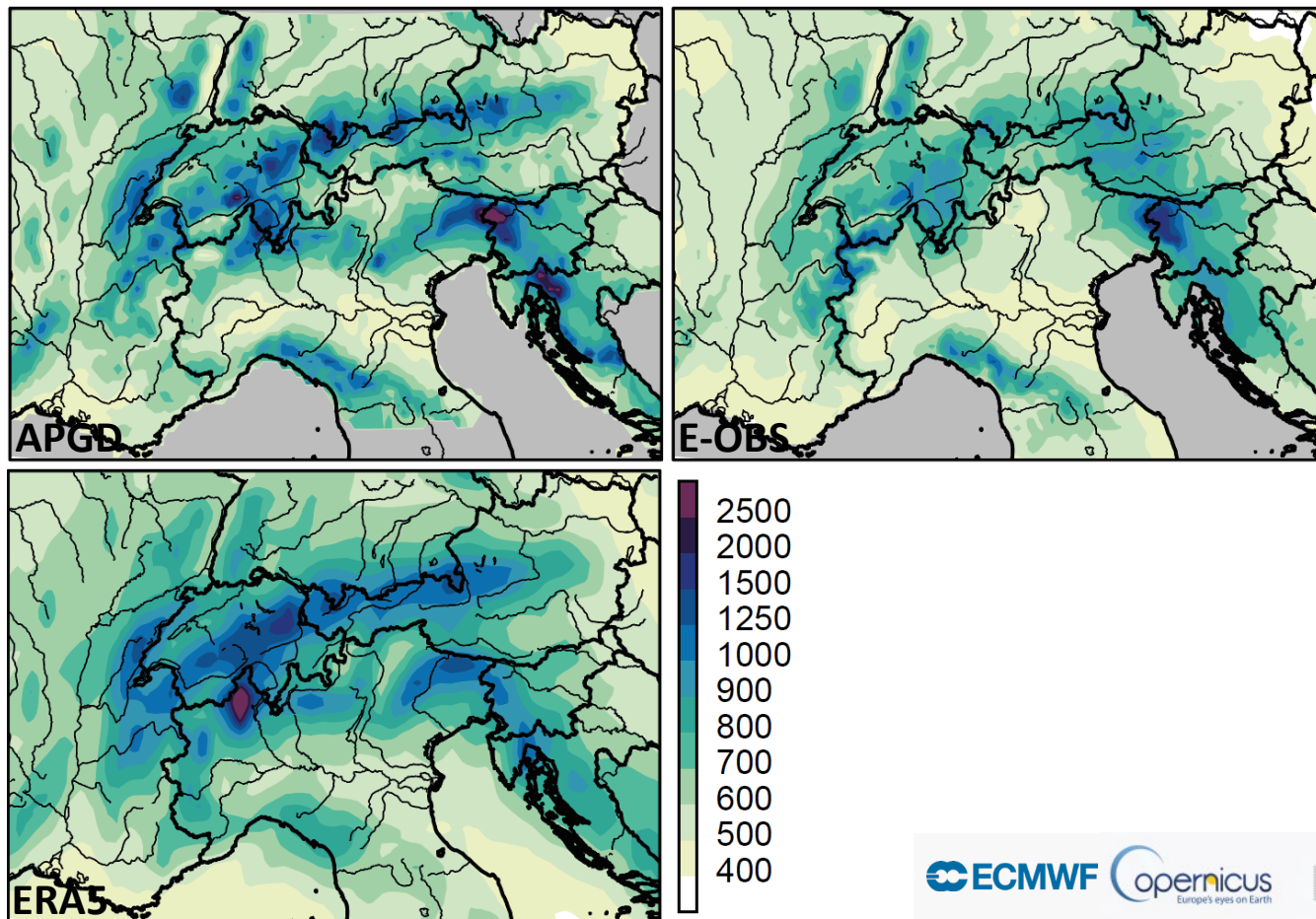
2. Research questions

- 1) Representation of **meso-beta scale precipitation patterns**
- 2) Varying **error structure** between regions
- 3) Reliability of **uncertainty** information



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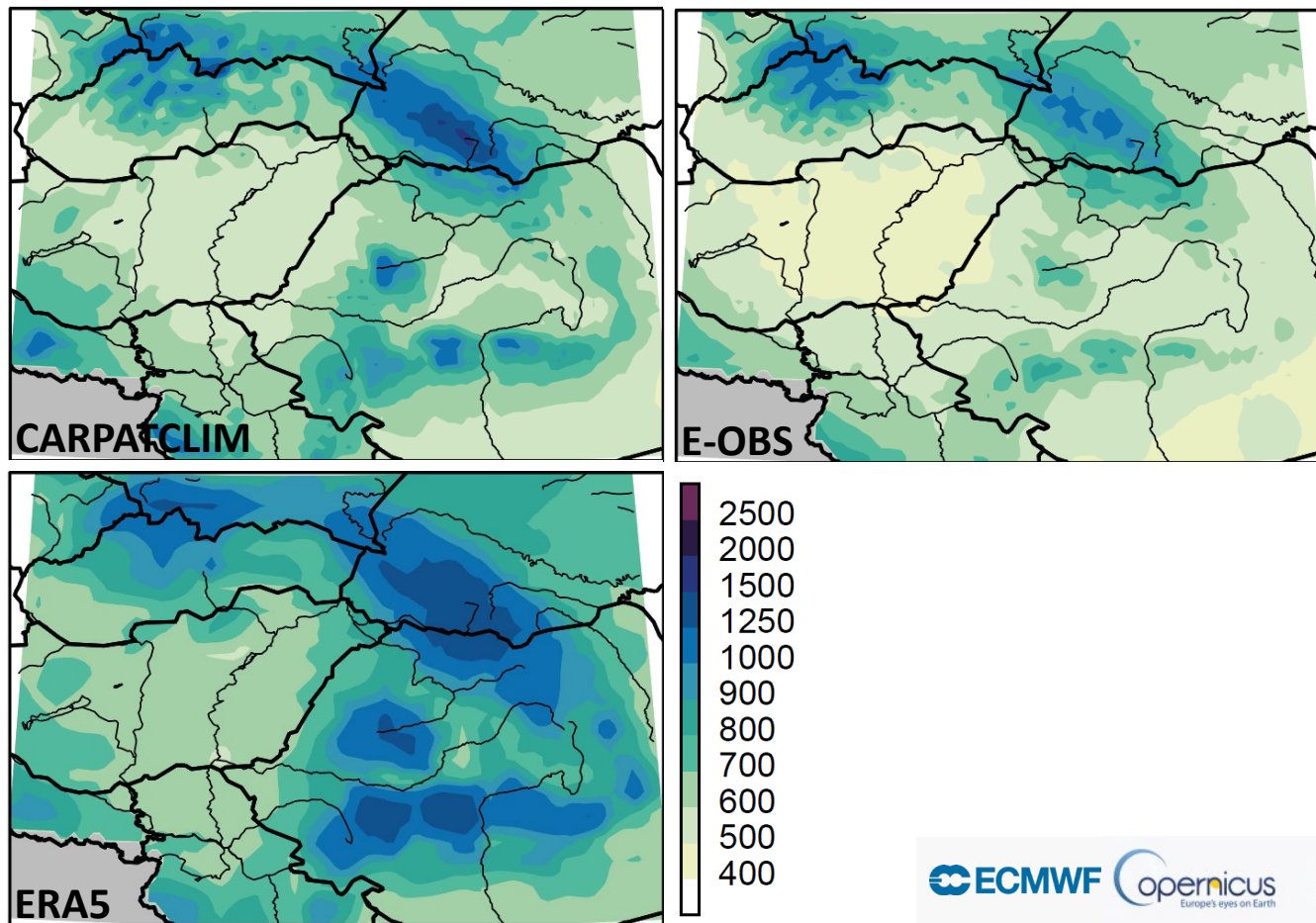
3.1 Mean annual precipitation





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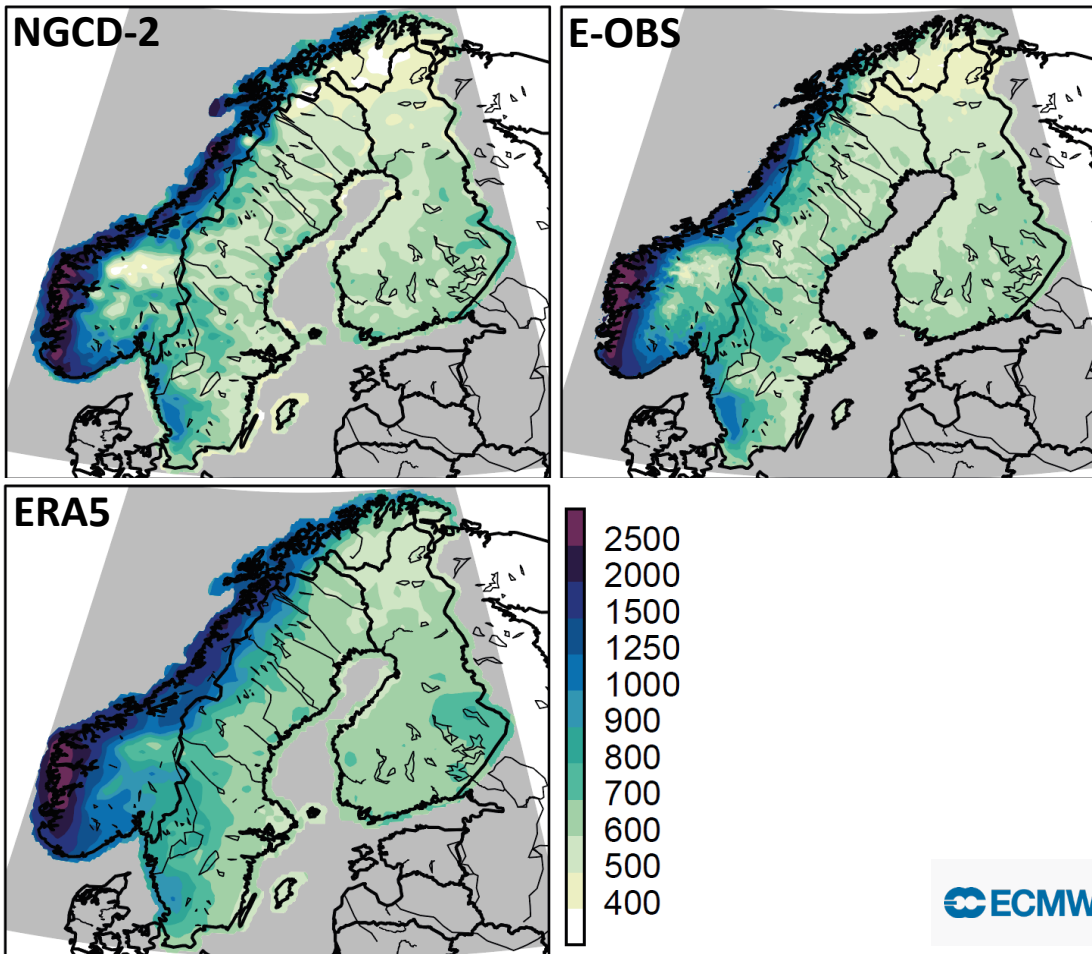


14.10.2020



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3.1 Mean annual precipitation

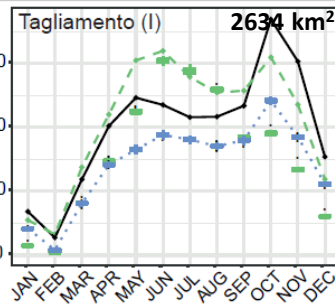
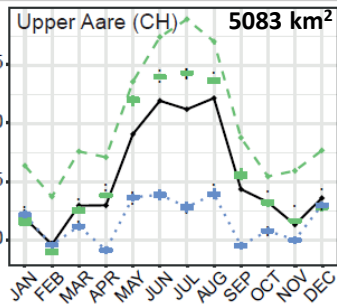
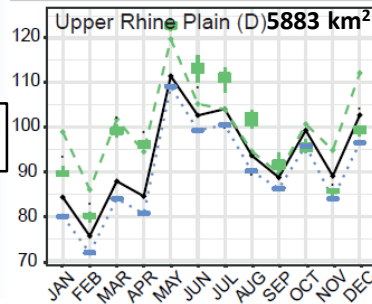




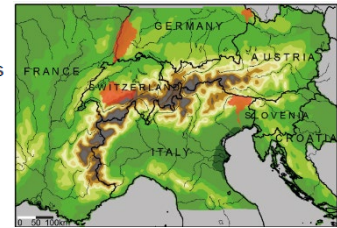
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3.2 Yearly cycle

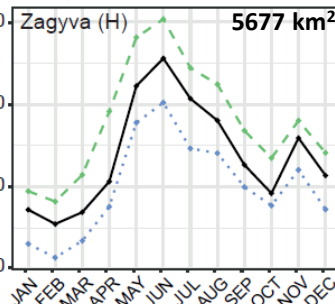
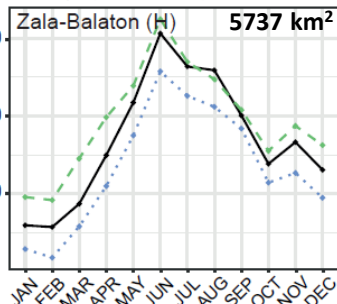
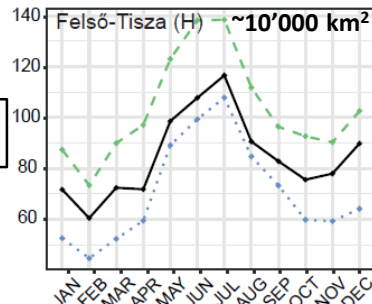
Alps



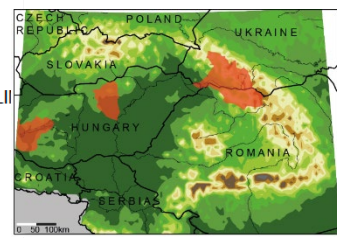
- probabilistic
 - ERA5-Ens
 - E-OBS-Ens
- deterministic
 - APGD
 - ERA5
 - E-OBS



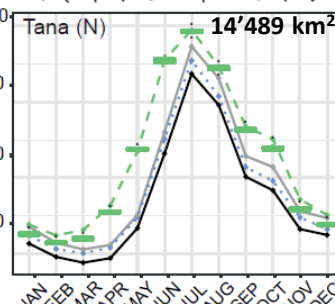
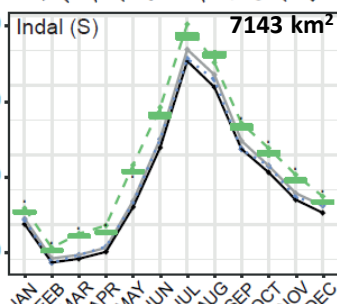
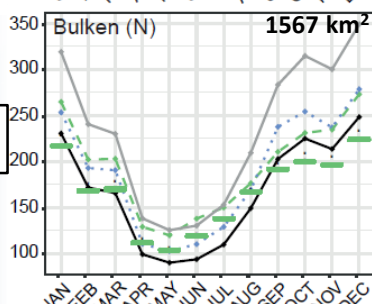
Carpathians



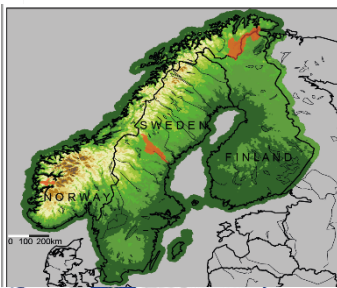
- deterministic
 - CARPATLI
 - ERA5
 - E-OBS



Fennoscandia



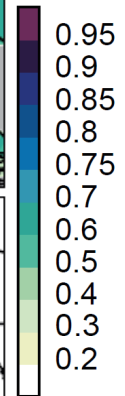
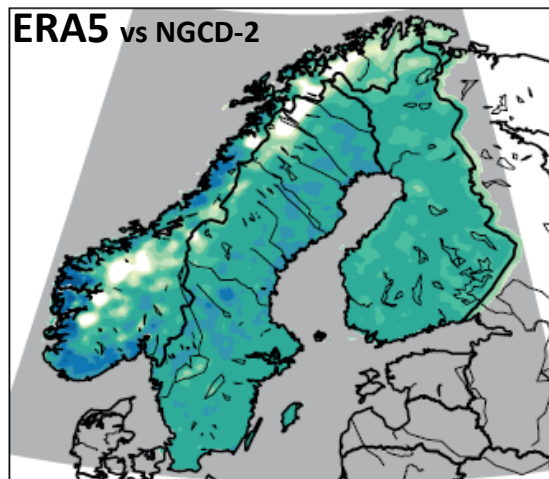
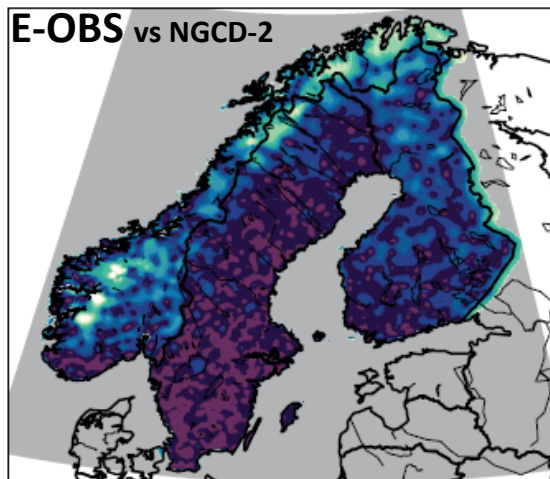
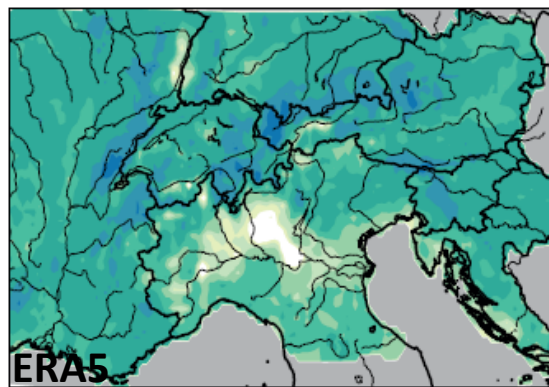
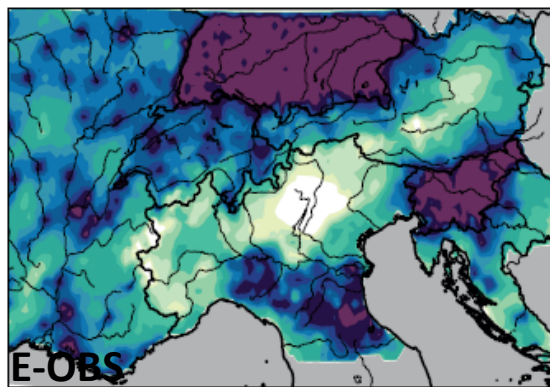
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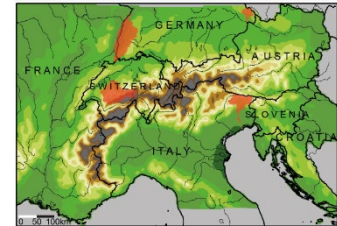
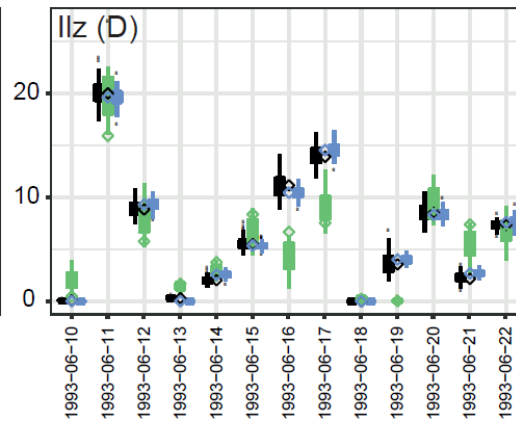
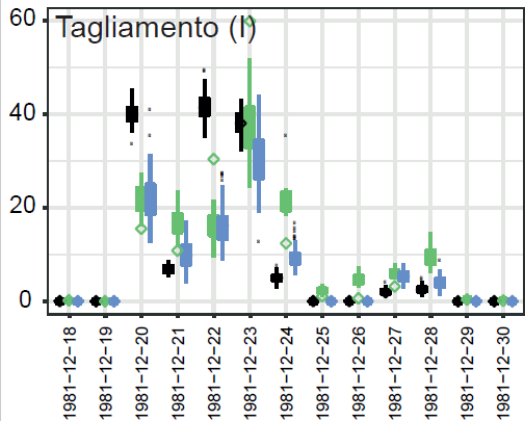
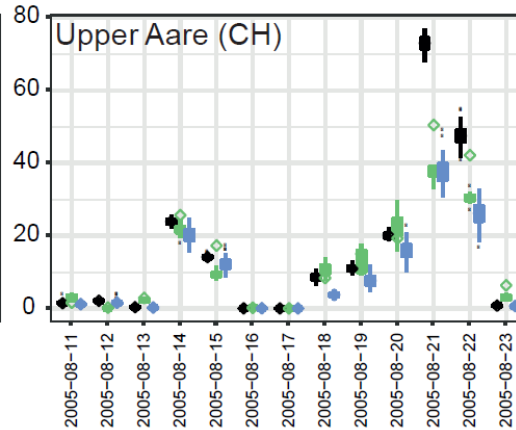
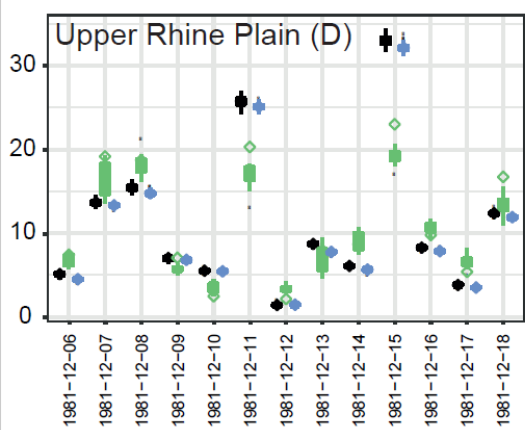
3.3 M S E S S





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3.4 Uncertainty



probabilistic

- APGD-Ens
- ERA5-Ens
- E-OBS-Ens

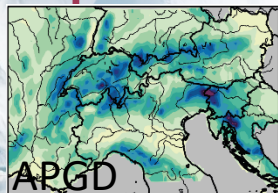
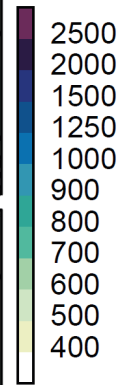
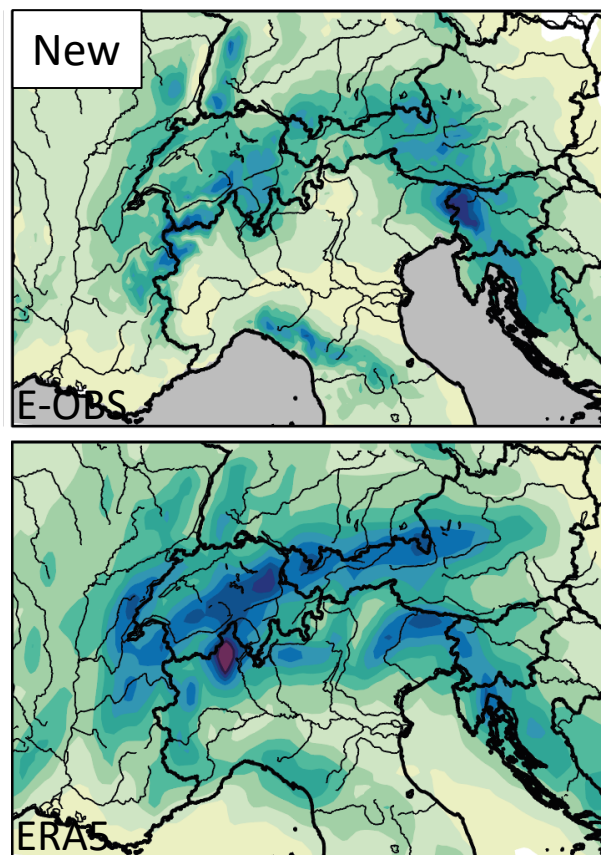
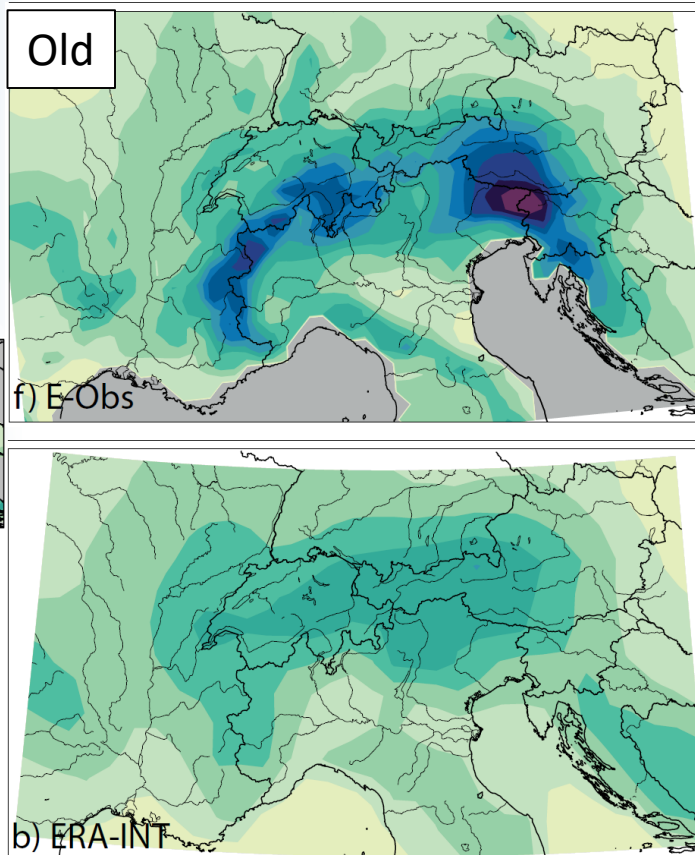
deterministic

- APGD
- ERA5
- E-OBS



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4. Conclusion



Isotta FA, Vogel R, Frei C. 2015. Evaluation of European regional reanalyses and downscalings for precipitation in the Alpine region. *Meteorologische Zeitschrift* **24**: 15–37.



4 . S u m m a r y

E-OBS:

- Representation of **meso-beta scale precipitation patterns**: overall realistic
- Underestimation of precipitation (depending on **data availability**)
- Underestimation of **uncertainty**

ERA5:

- Representation of **precipitation climate**: overall realistic
- Systematic overestimation of precipitation
- Underestimation of **uncertainty** (coarser spatial resolution)



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Thank you for listening!



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Christoph Frei

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