Inter-comparison of climatological datasets for the hydrological modelling of six european catchments

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2. Geographic Information Science Group, Institute of Geography, Friedrich Schiller University Jena, Löbdergraben 32, 07743 Jena, Germany

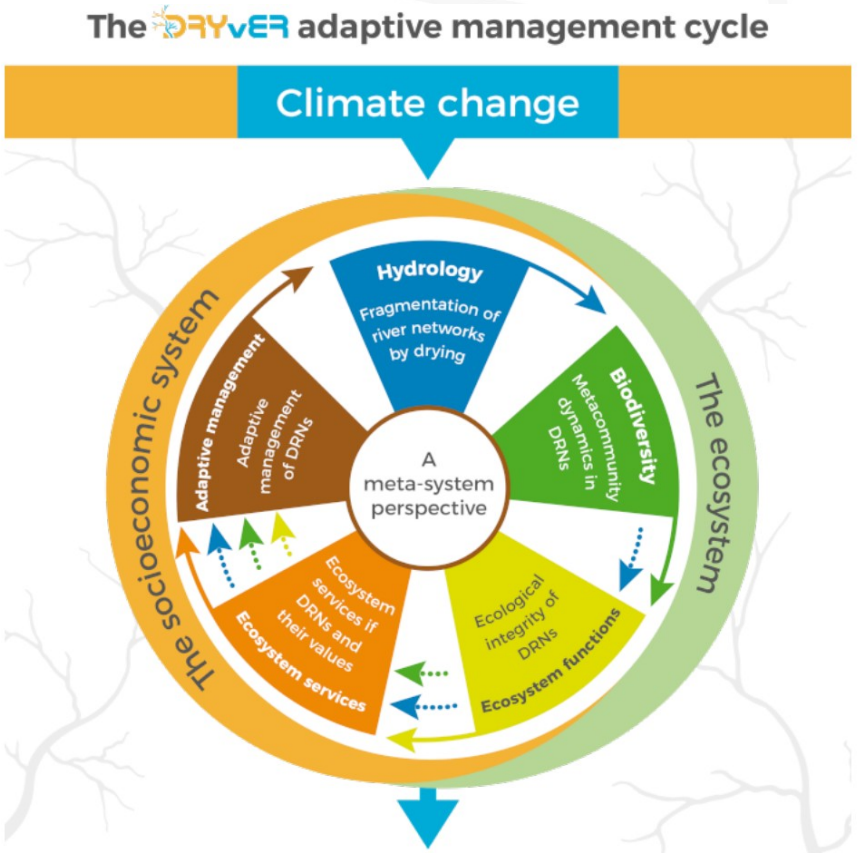
Contact : louise.mimeau@inrae.fr

EGU HS2.4.2 Understanding and modelling hydrological response under climate variability and change

SCAN ME

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869226

DRYvER Project: Drying rivers and climate change



Adaptive management of drying river networks
(Datry et al., 2021)

(Photos by Thibault Datry; INRAE)

Develop models to estimate the impact of climate change on flow intermittence

6 case studies in Europe

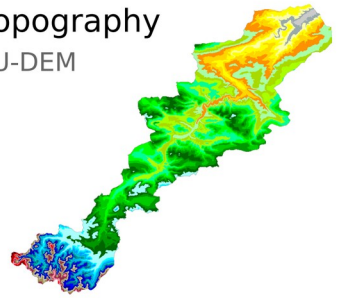
DRYvER project

Harmonized hydrological modeling method for the 6 case studies

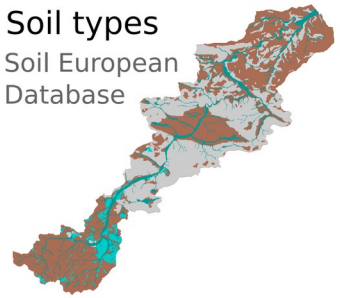
Common databases

Geophysical data

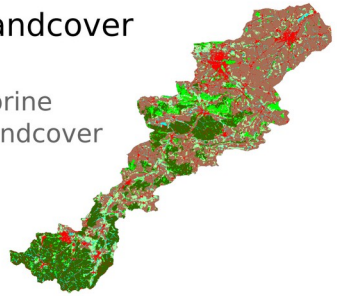
Topography
EU-DEM



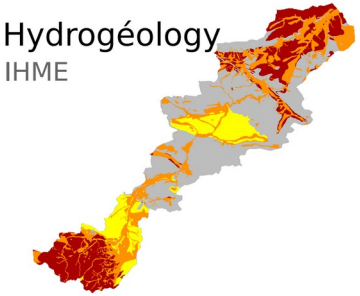
Soil types
Soil European Database



Landcover
Corine Landcover

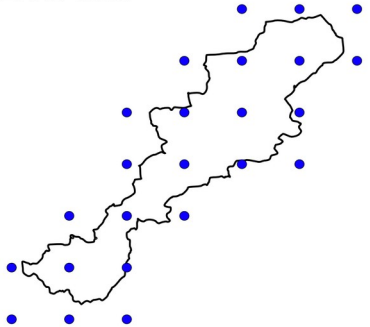


Hydrogéology
IHME



Climate data

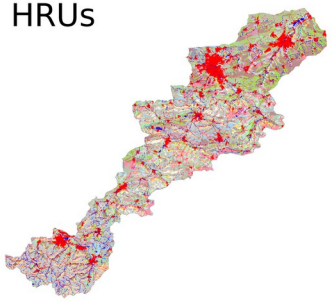
Temperature
Precipitation
Reference Evap.
ERA5-land



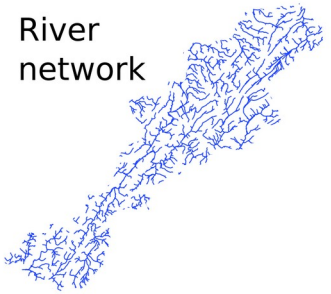
Common modelling approach

Spatial discretization

HRUs

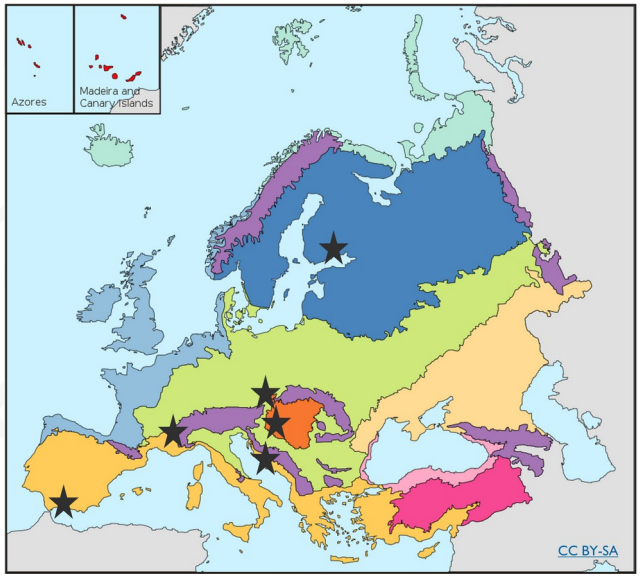


River network



Temporal discretization : daily

JAMS-J2000 model



Biogeographical regions of Europe

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- Boreal
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After a map by the European Environment Agency: www.eea.eu.ir

★ DRYvER case studies

JAMS

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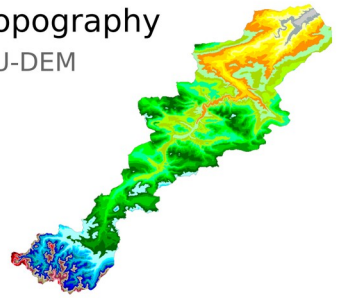

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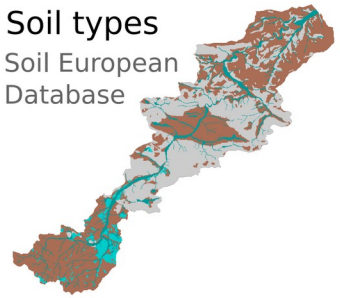

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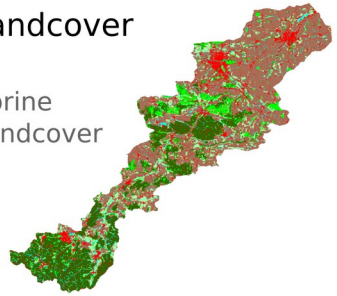

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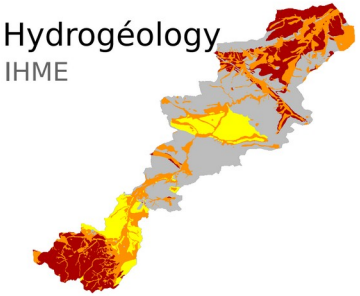

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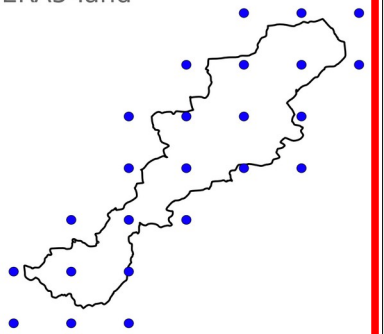

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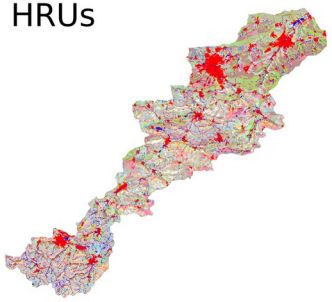

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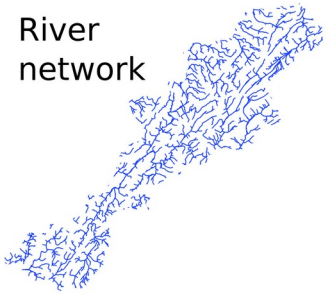

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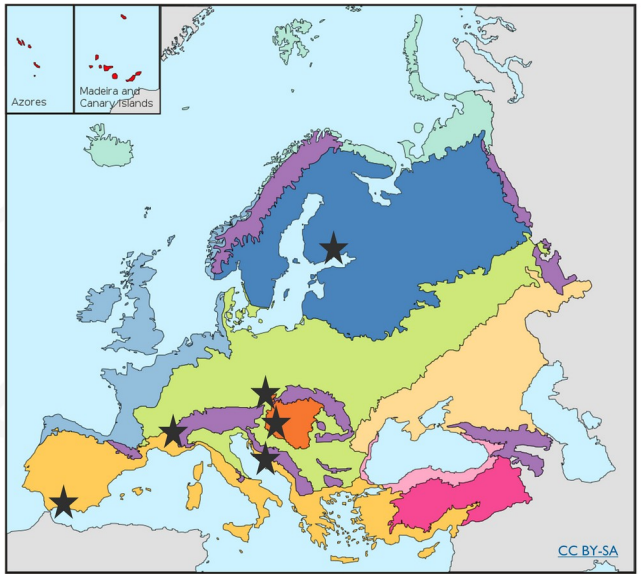

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★ DRYvER case studies

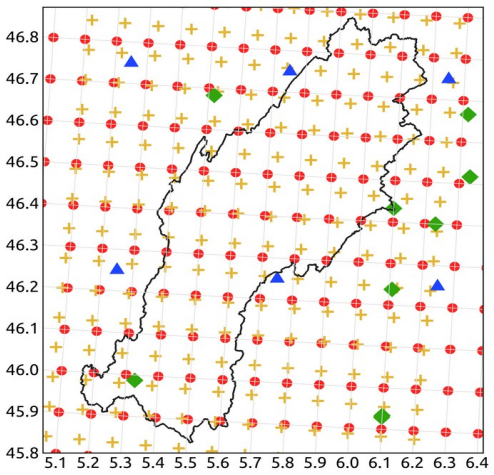
Inter-comparison of climate datasets (regionals and locals)

1. Estimate the uncertainty related to climate forcing data
2. Evaluate the performance of European/Global datasets on local catchments with different geographic and climatic conditions

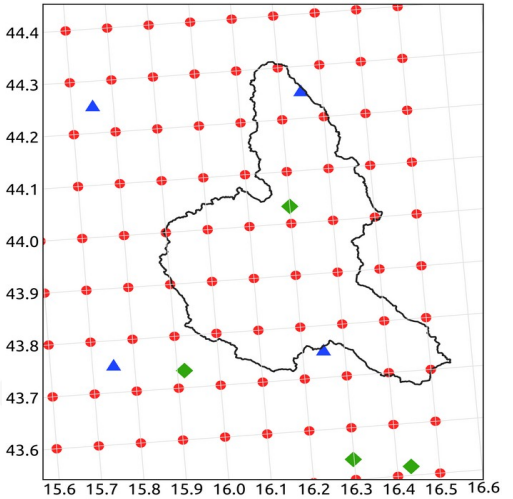
Climate datasets

● **Era5-Land** (Global)	0.1°
▲ **WFDE5** (Global)	0.5°
● **Eobs** (Europe)	0.1°
● **CarpatClim** (Hungary)	0.1°
+ **Safran** (France)	8 km
◆ **Local stations**	-

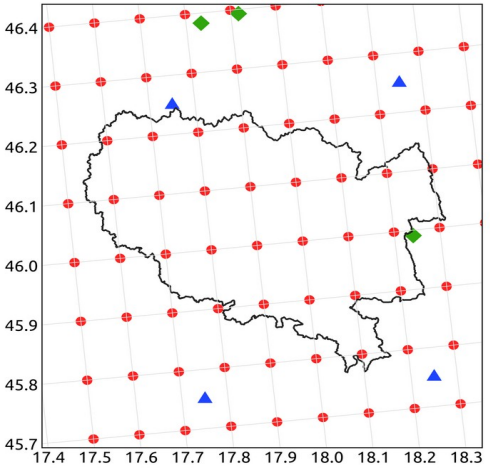
Ain, France

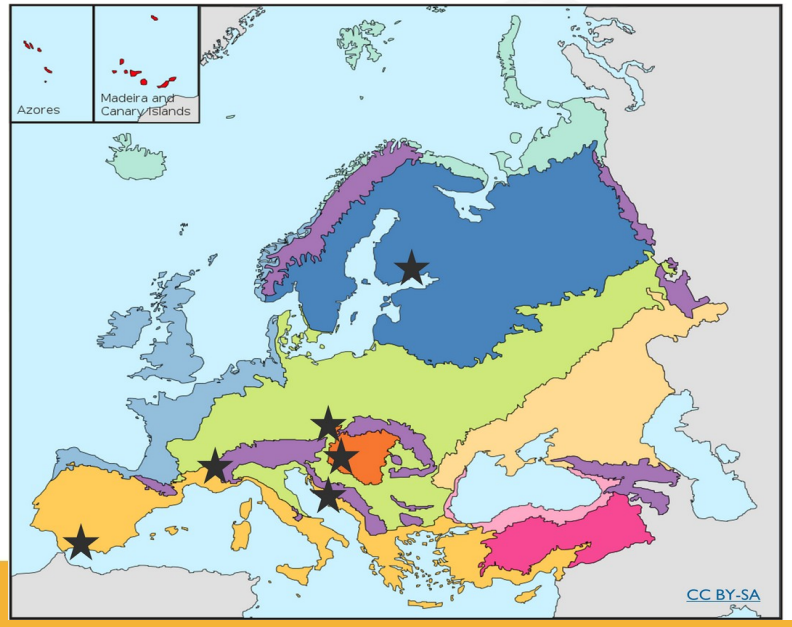


Krka, Croatia



Fekete, Hungary





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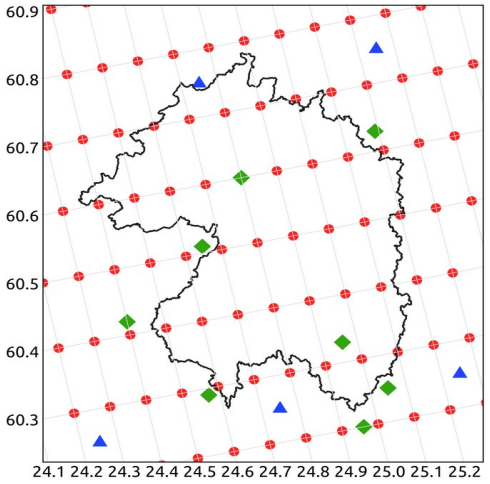
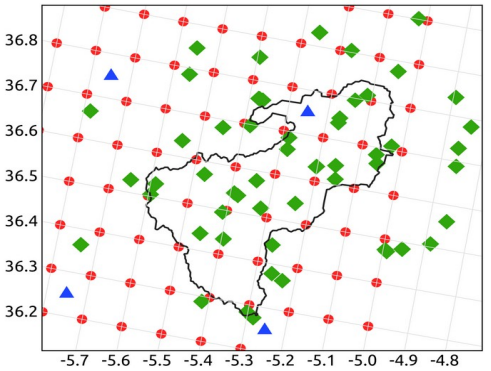
Vantaanjoki, Finland



Guadiaro, Spain



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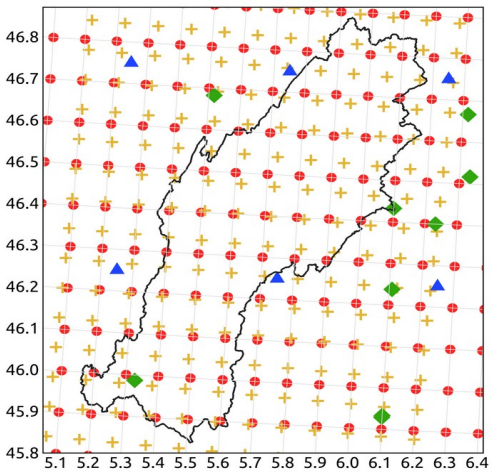

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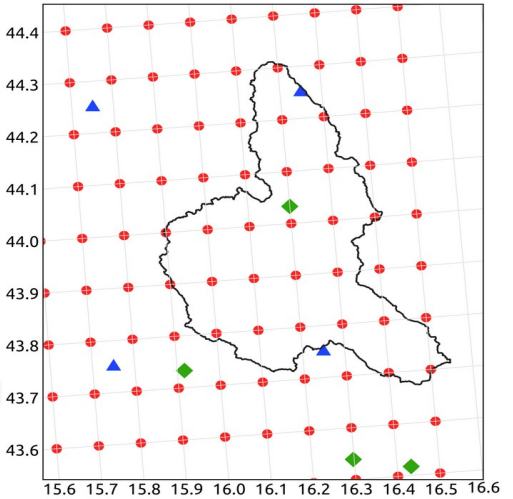

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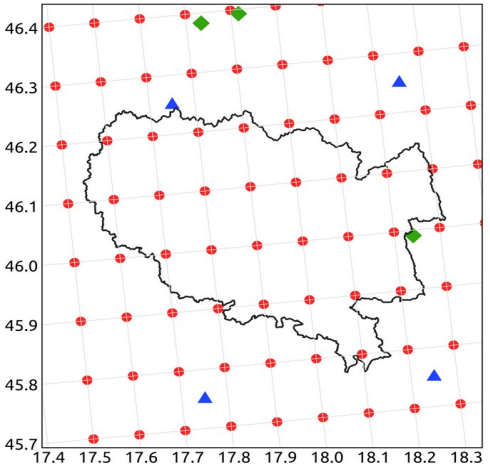

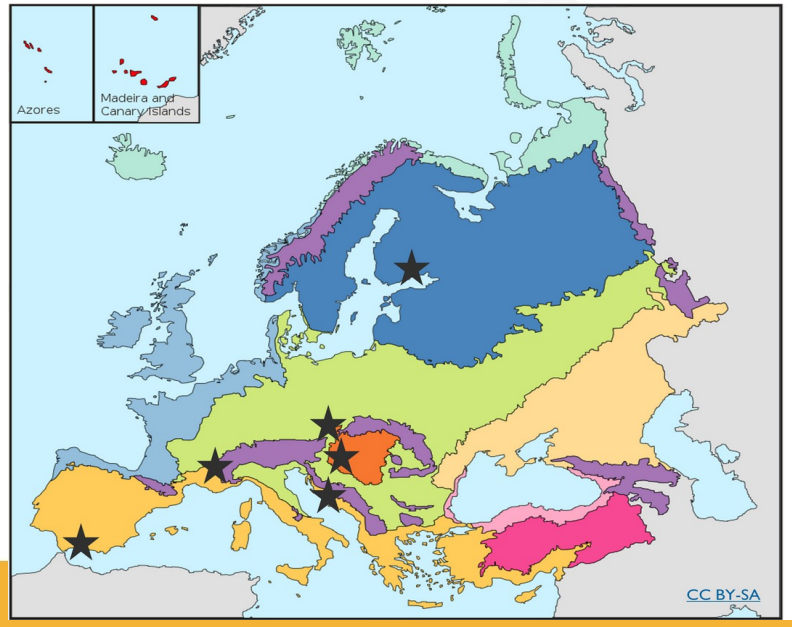

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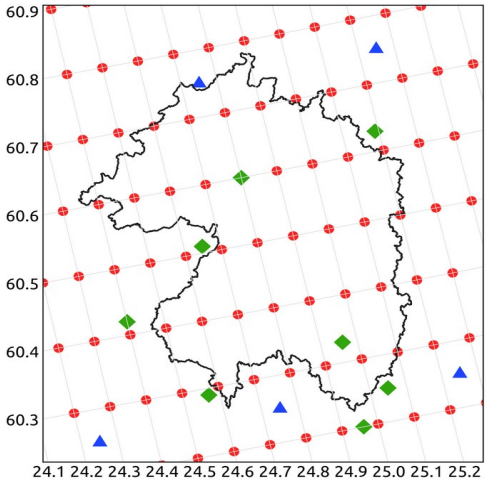

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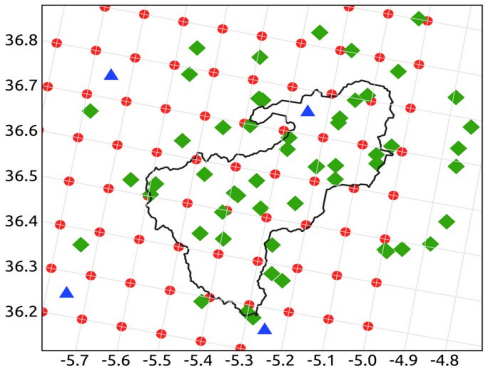

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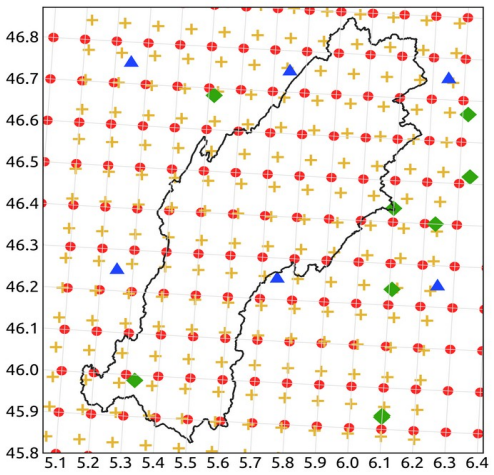

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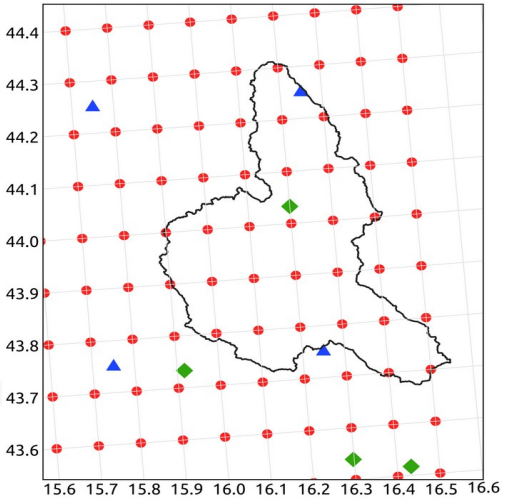

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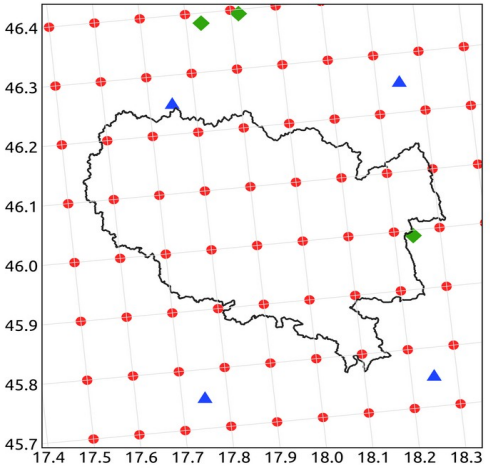

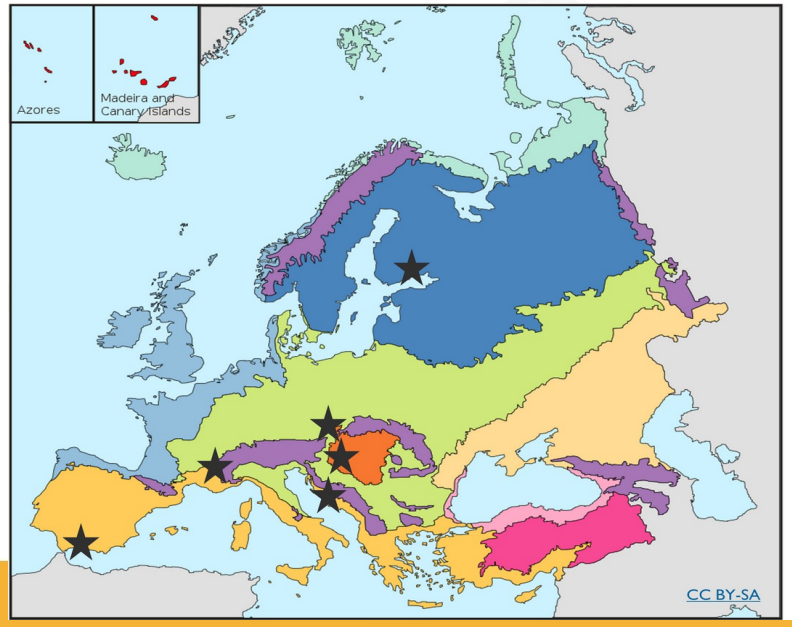

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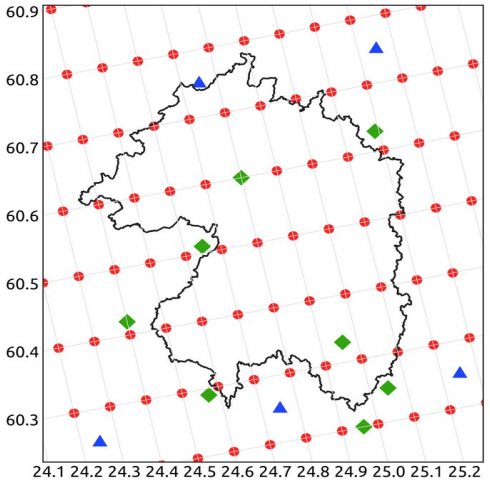

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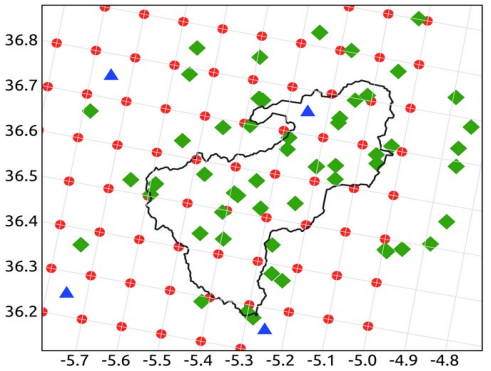

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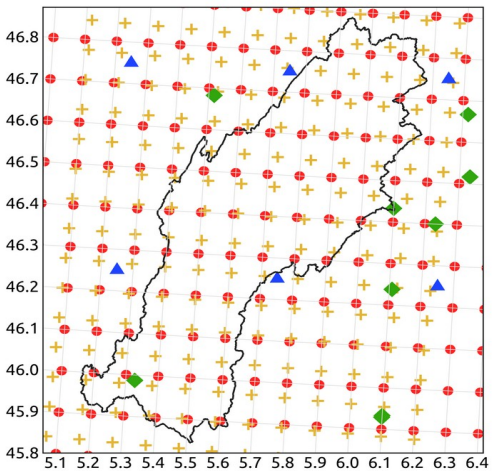

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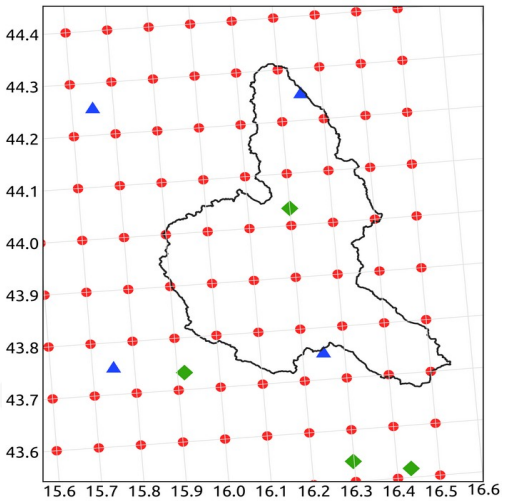

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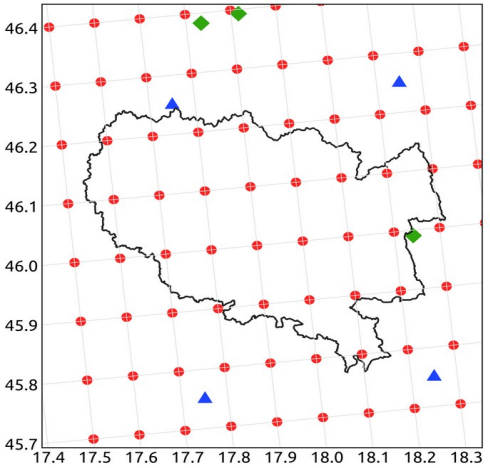

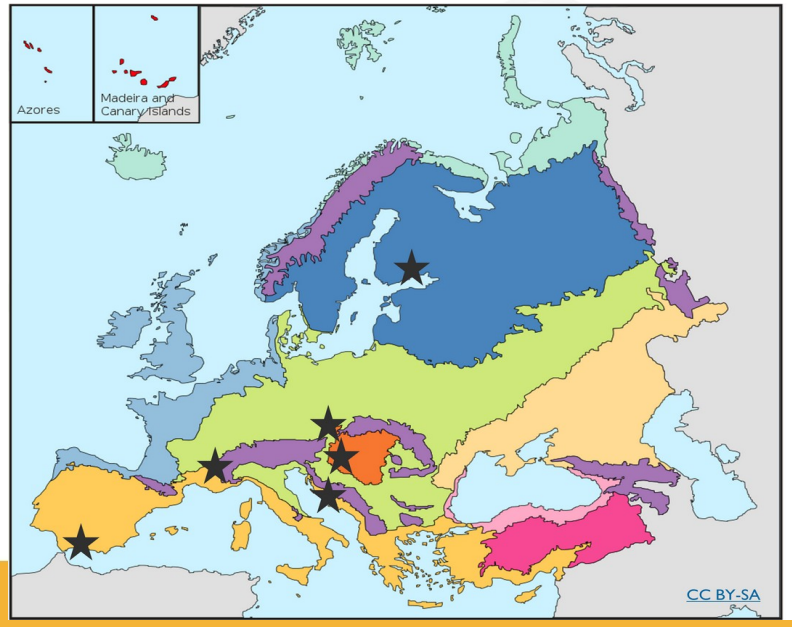

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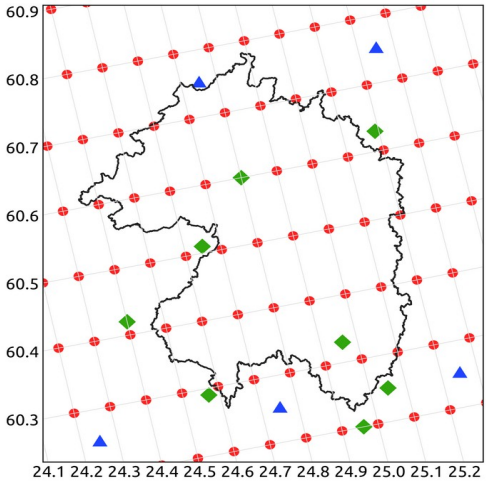

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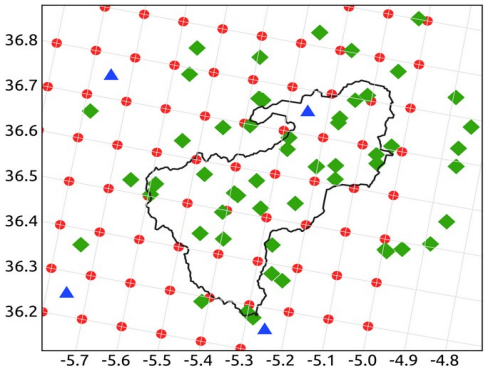

Comparison of the climate datasets

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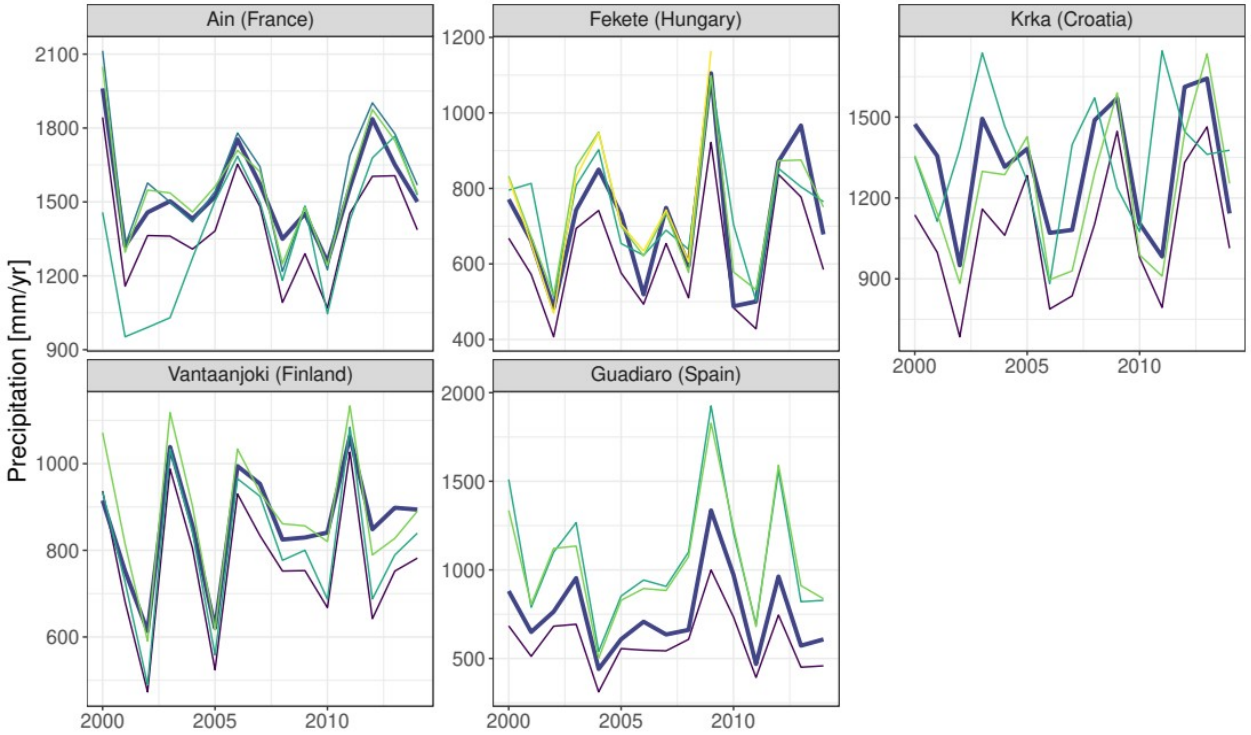
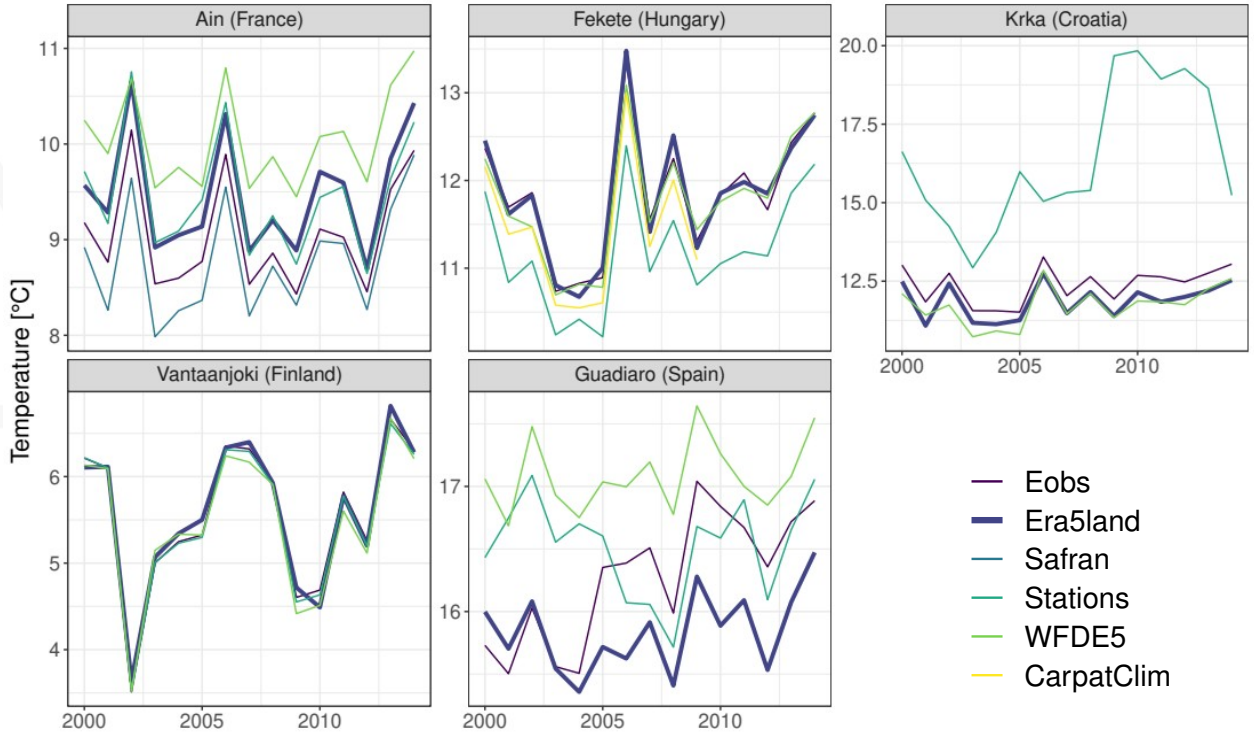
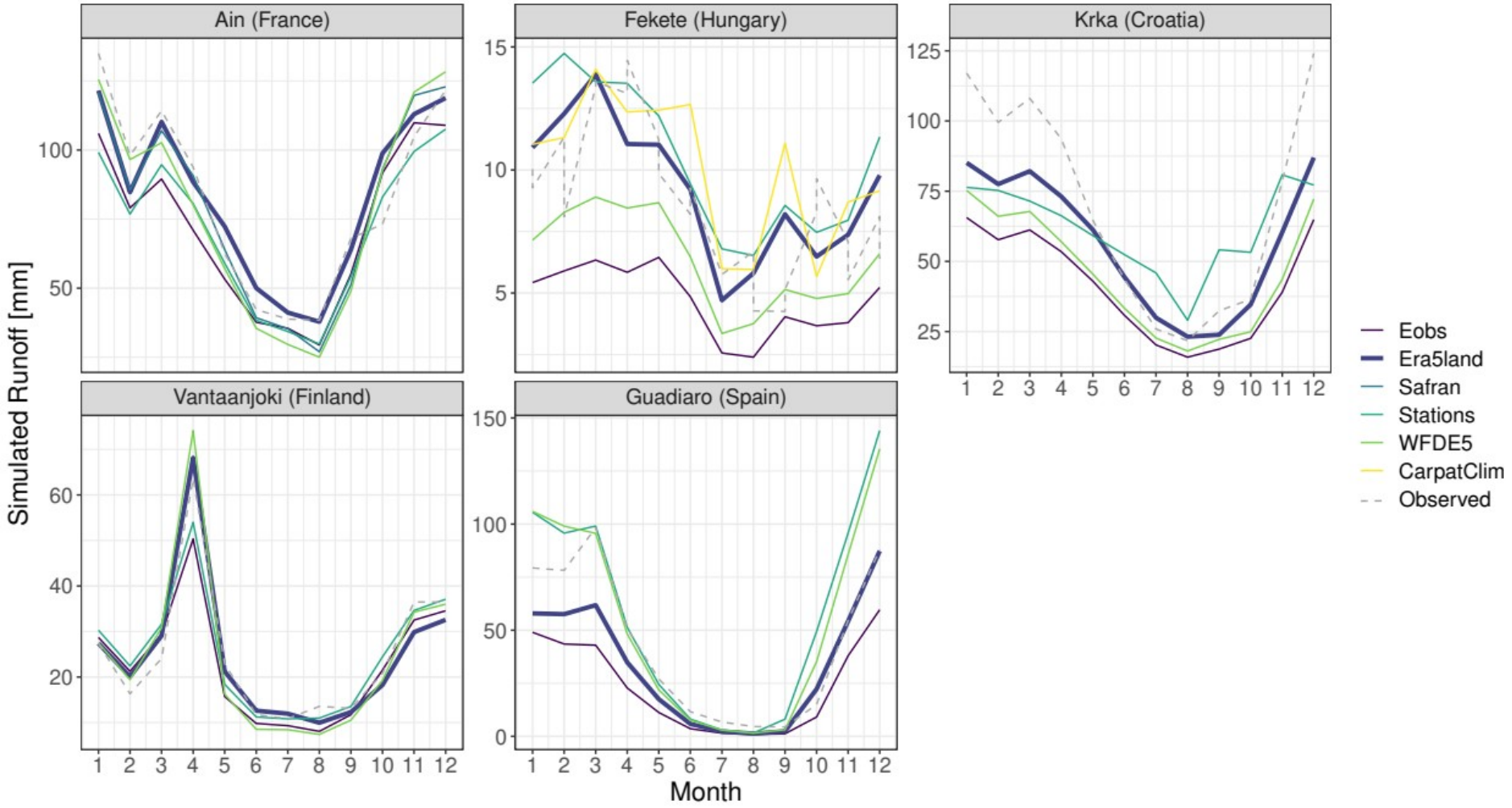


Mean annual temperature



Impact on simulated runoff

(all models were calibrated with the Era5-Land dataset)



Key home message :

- There is overall good agreement between the datasets
- There is a higher uncertainty related to the forcing datasets in cachments with few in-situ observations

Related EGU2022 presentations :

Prediction of flow intermittence in Drying River Networks using a process-based hydrological model
Annika Künne, Louise Mimeau, Flora Branger, and Sven Kralisch
HS2.2.1 Tue, 24 May, 15:28–15:34

Using the advanced delta change approach and a distributed model for a rapid assessment of reach-scale streamflow projections in intermittent rivers
Alexandre Devers, Claire Lauvernet, and Jean-Philippe Vidal
HS2.4.2 Mon, 23 May, 11:38–11:44

Thank you for your attention !

Contact : louise.mimeau@inrae.fr

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869226