Recent work in Data Assimilation

Alina Dumitru

GeoSphere Austria · DHMZ · Czech Hydrometeorological Institute · OMSZ · IMGW · METEO ROMANIA · SHMU · ARSO METEO Slovenia

Current operational setup

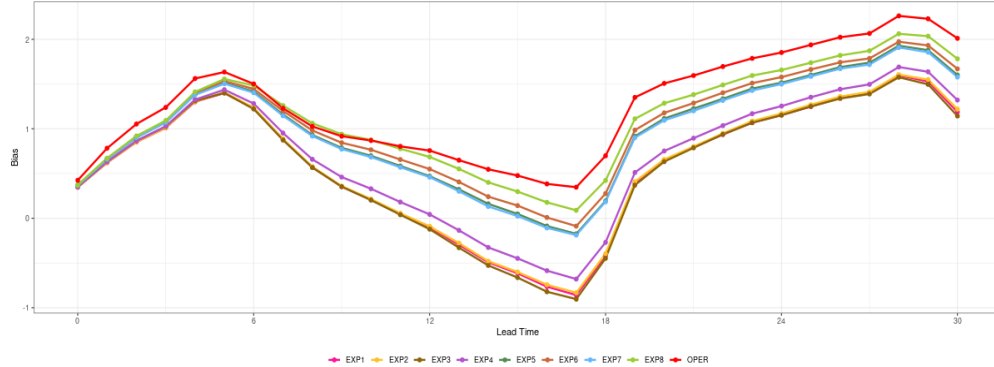| CY43t2 - ALARO-0	CY43t2 bf11 - ALARO-1vB
6.5 km	4km
semi-implicit semi-Lagrangian 2TL Δt=240 s	semi-implicit semi-Lagrangian 2TL Δt=180 s
240 x 240 points 60 vertical levels Linear grid Lambert projection	600 x 432 points 60 vertical levels Linear grid Lambert projection
LBC from ARPEGE (3h)	LBC from ARPEGE (3h)
DFI Initialization	DFI Initialization
RUNS: 00, 06, 12, 18 UTC (NO DA)	RUNS: 00, 06, 12, 18 UTC (NO DA)
forecast range: 78/54/78/54 hours	forecast range: 78/54/78/54 hours
FULLPOS in line – geographical grid (0.06° x 0.085°)	FULLPOS in line – geographical grid (0.035° x 0.05°)
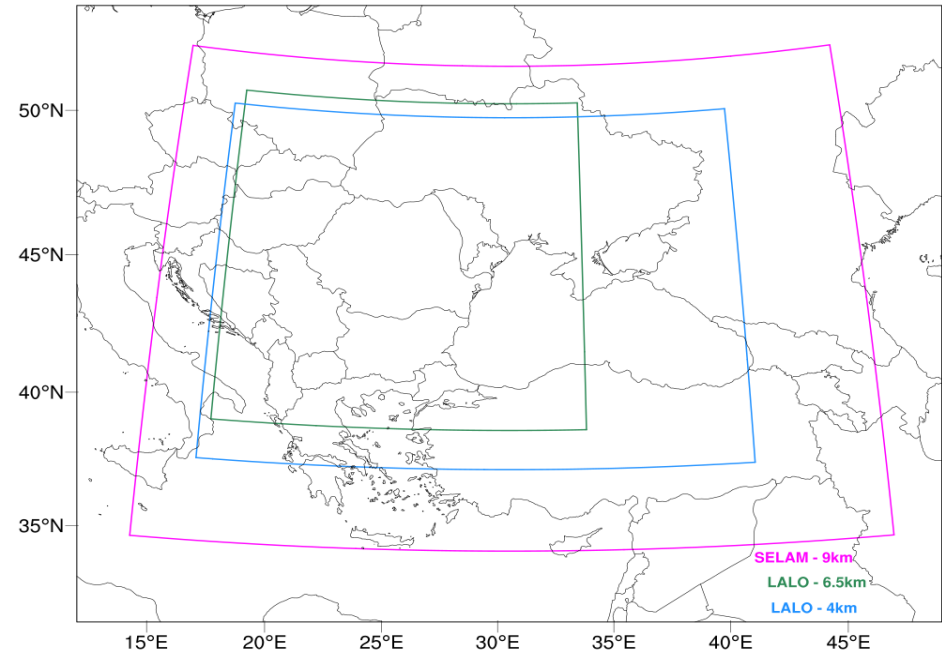
Changes: At the moment we are running in parallel surface data assimilation operationally at 4 km horizontal resolution for 30 hours forecast range (RUNS: 00, 06, 12, 18 UTC)
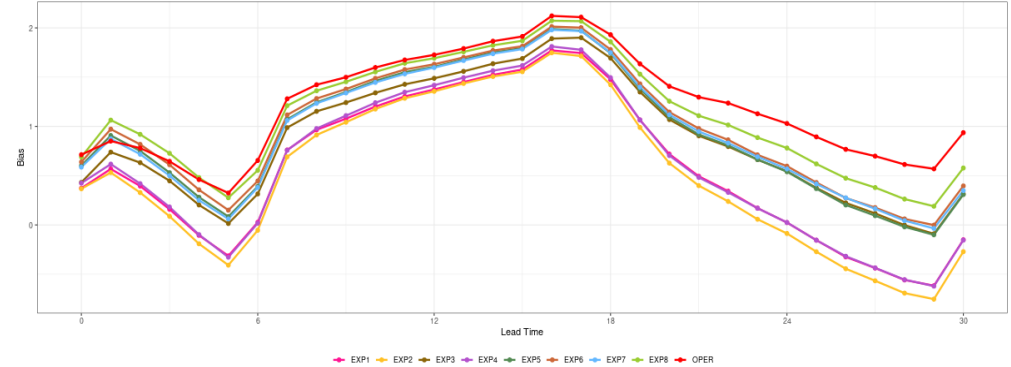
GeoSphere Austria — DHMZ — Czech Hydrometeorological Institute — OMSZ — IMGW — METEO ROMANIA — SHMU — ARSO METEO Slovenia

CANARI experiments

Name of experiment	EXP1	EXP2	EXP3	EXP4	EXP5	EXP6	EXP7	EXP8
Version of ISBA polynomes	analyse.isba02	analyse.isba03	analyse.isba04	analyse.isba05	analyse.isba02	analyse.isba03	analyse.isba04	analyse.isba05
Origin of the analyse.isba.file	From Meteo-France	From Meteo-France	Create based on alayse.isba02 where values from fourth coulumn on were multiply by 2	Create based on alayse.isba03 where values from fourth coulumn on were divided by 2	From Meteo-France	From Meteo-France	Create based on alayse.isba02 where values from fourth coulumn on were multiply by 2	Create based on alayse.isba03 where values from fourth coulumn on were divided by 2
SMU0 - Zenith solar angle taken into account	SMU0=0.	SMU0=0.	SMU0=0.	SMU0=0.	SMU0=7.	SMU0=7.	SMU0=7.	SMU0=7.

GeoSphere Austria · DHMZ · Czech Hydrometeorological Institute · OMSZ · IM-GW · METEO ROMANIA · SHMU · ARSO METEO Slovenia

CANARI scores – BIAS for t2m and rh2m
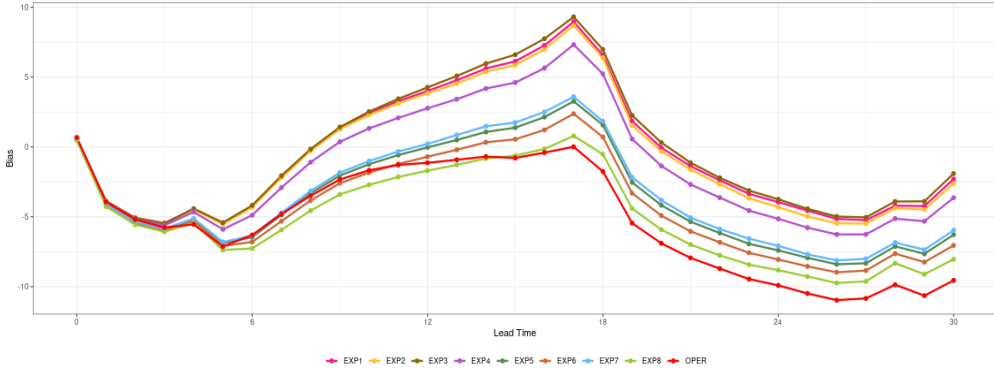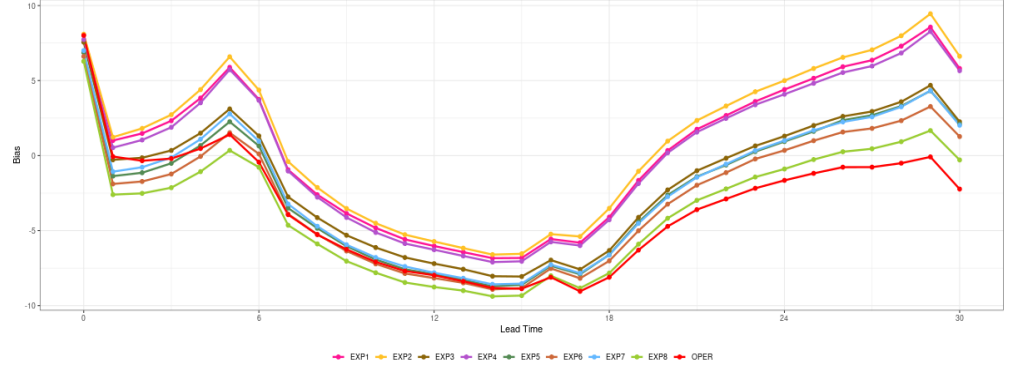
Monthly scores: t2m (*upper panel*) and rh2m (*lower panel*) for 00 UTC – *(left)* and 12 UTC - *(right)*

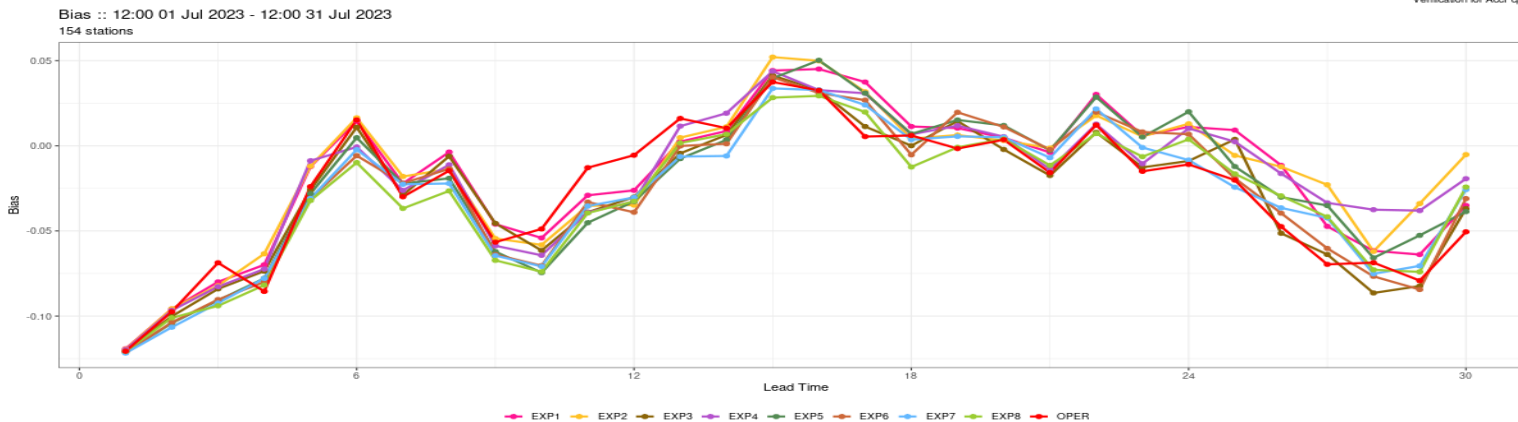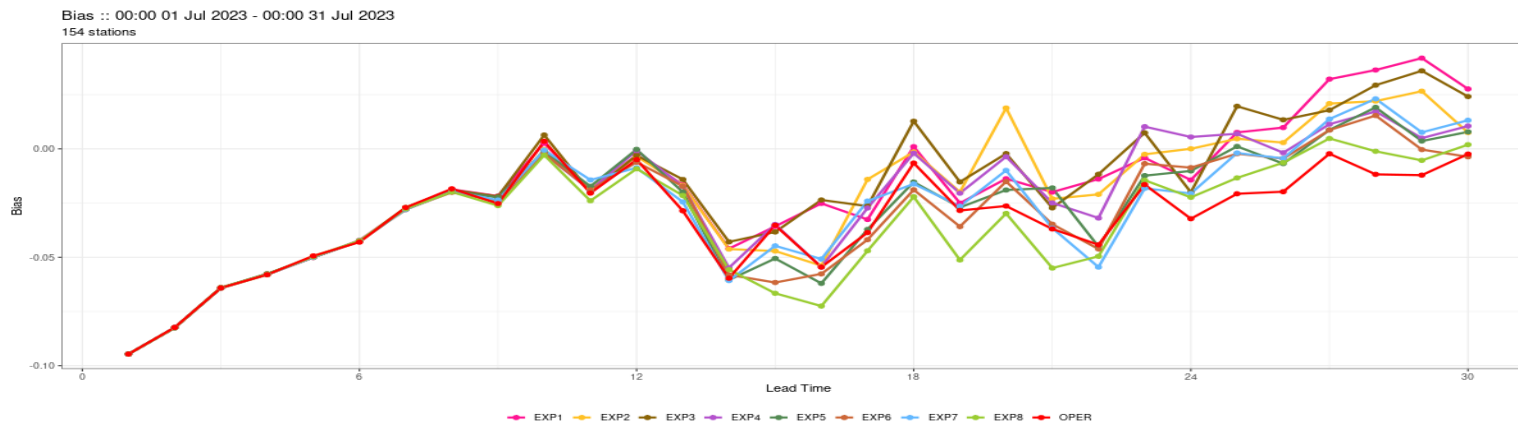# CANARI scores – BIAS for wind speed and wind gust at 10 m
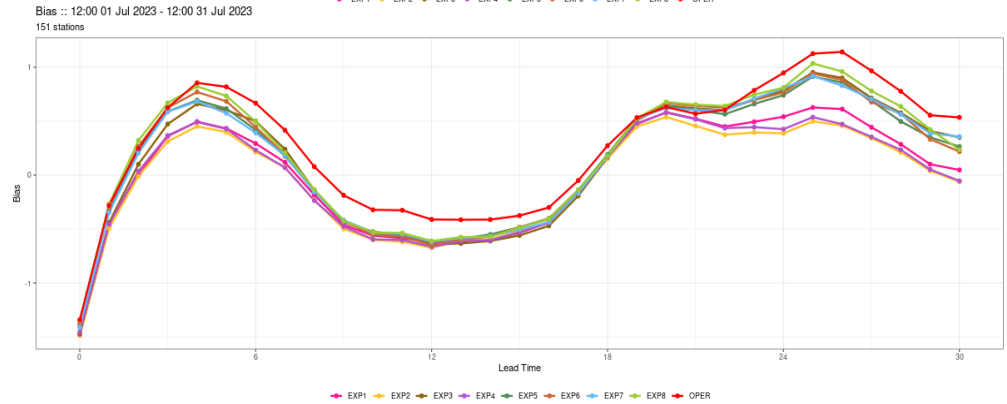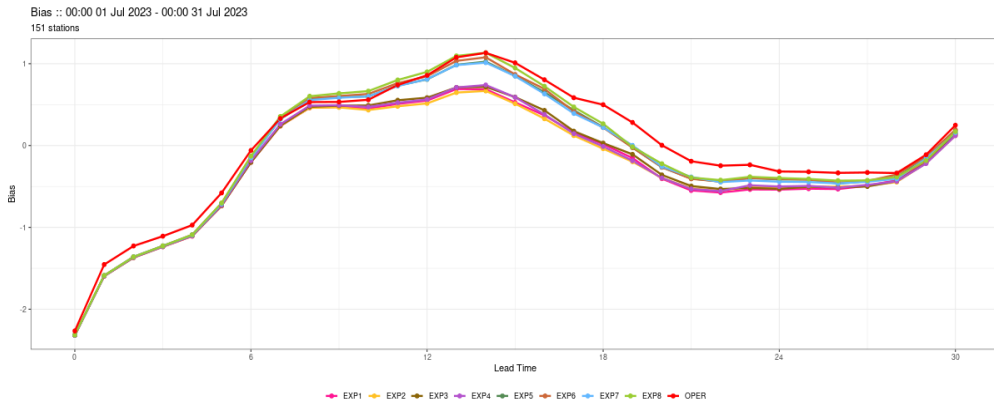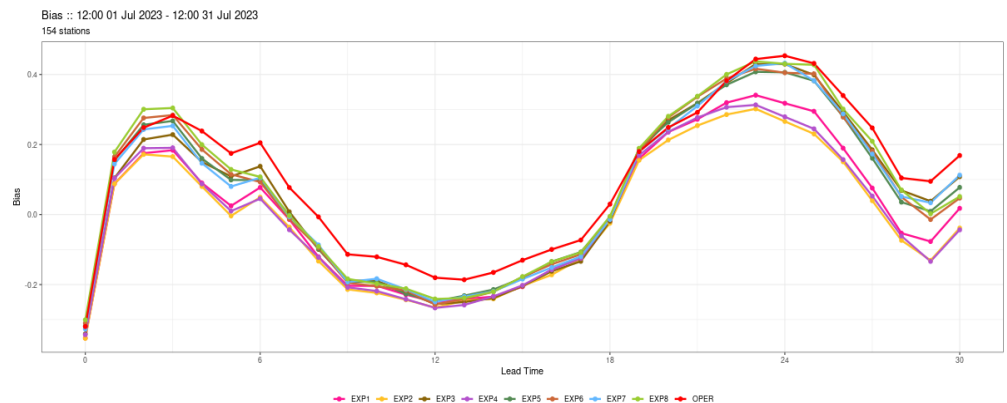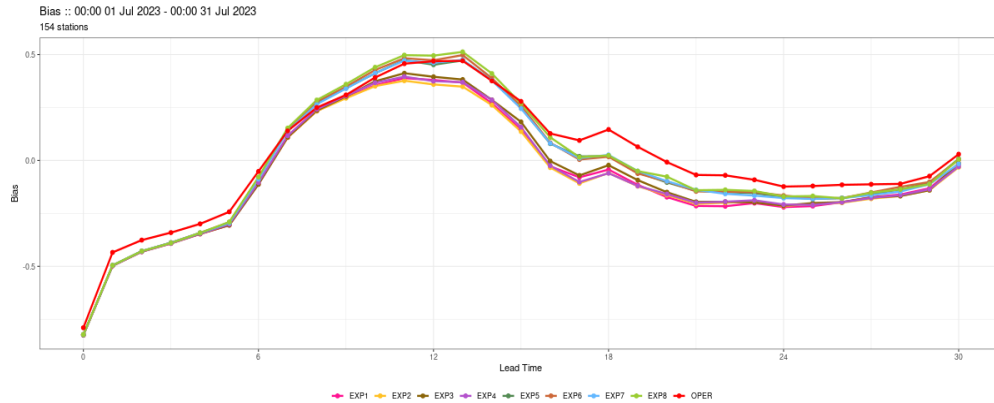
Monthly scores: wind speed at 10m (*upper panel*) and wind gust at 10m (*lower panel*) for 00 UTC (*left*) and 12 UTC (*right*)

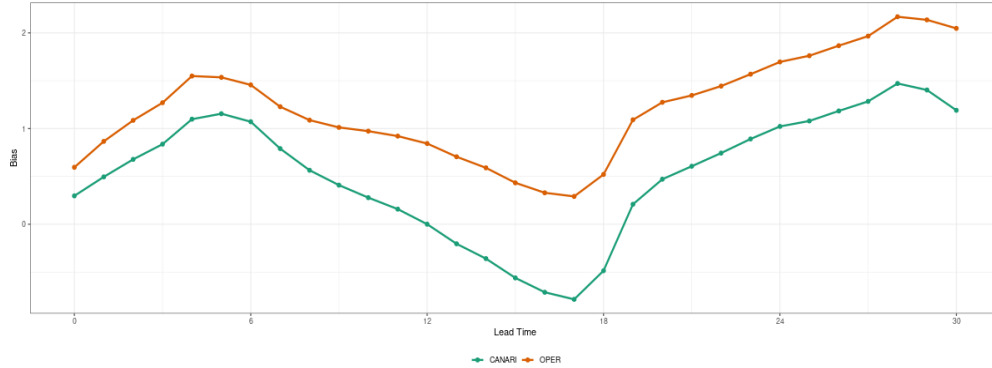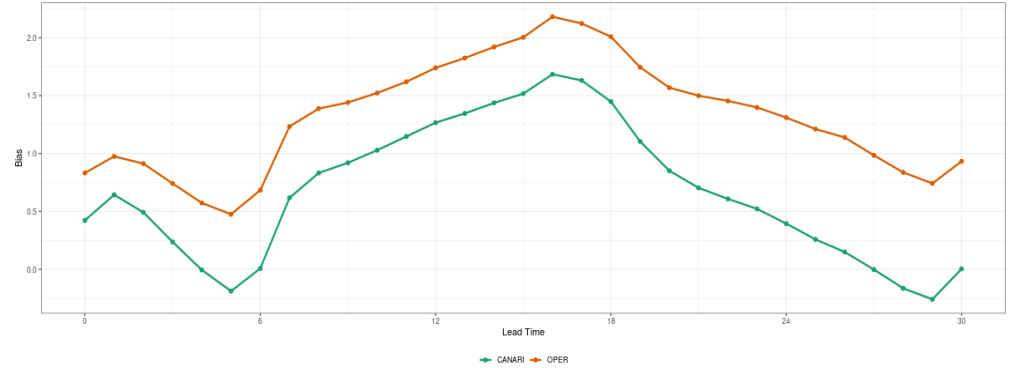# CANARI scores – BIAS for hourly precipitation

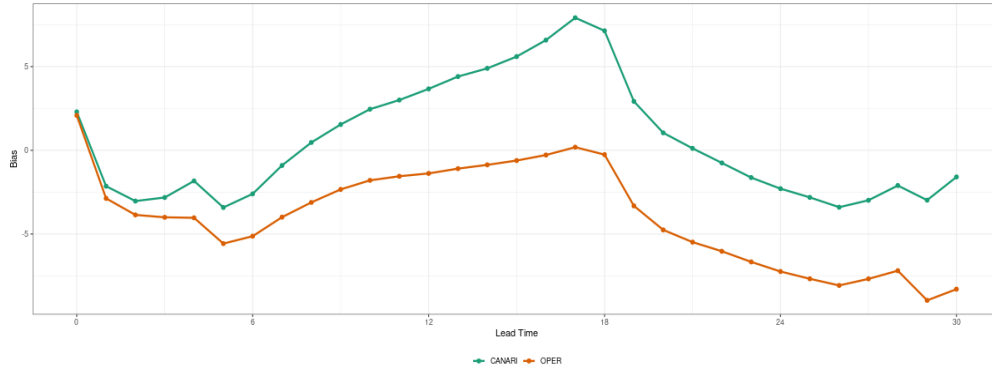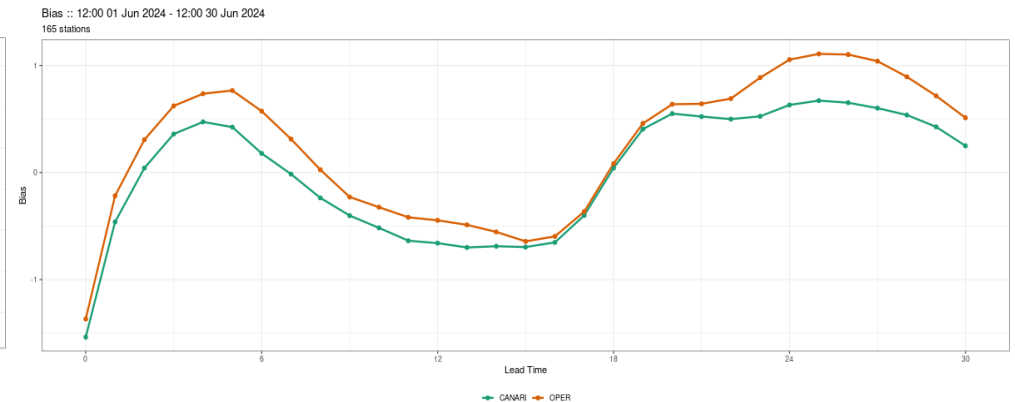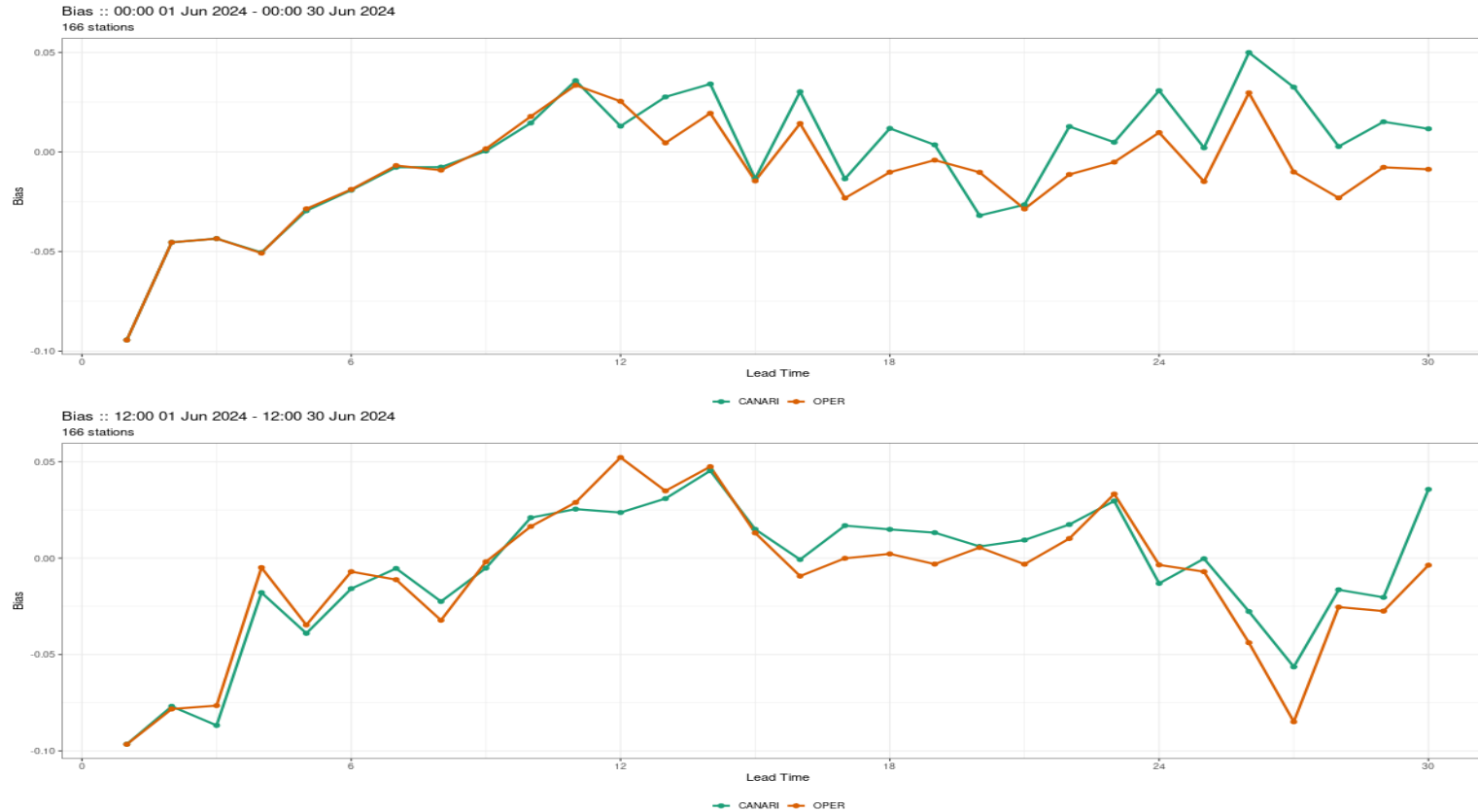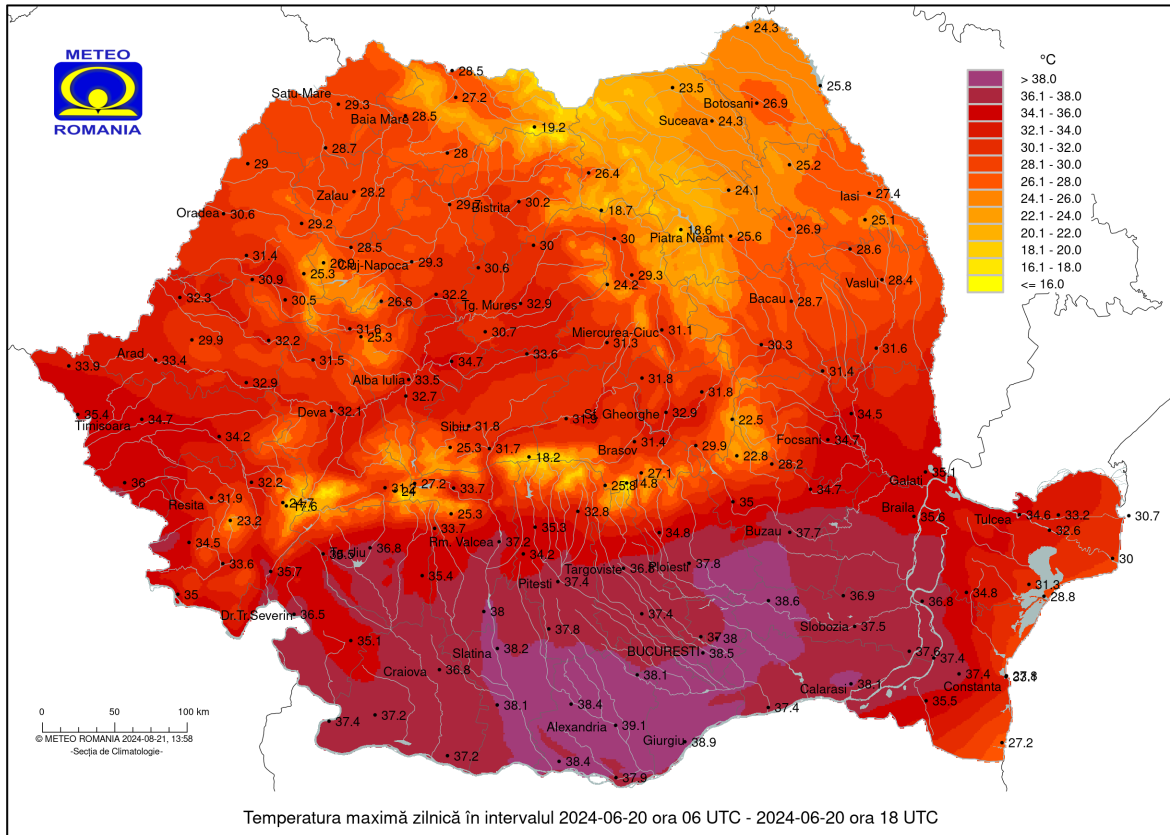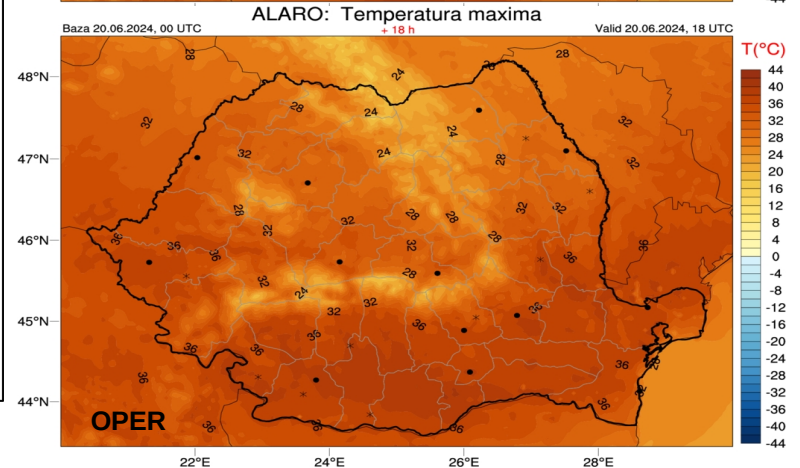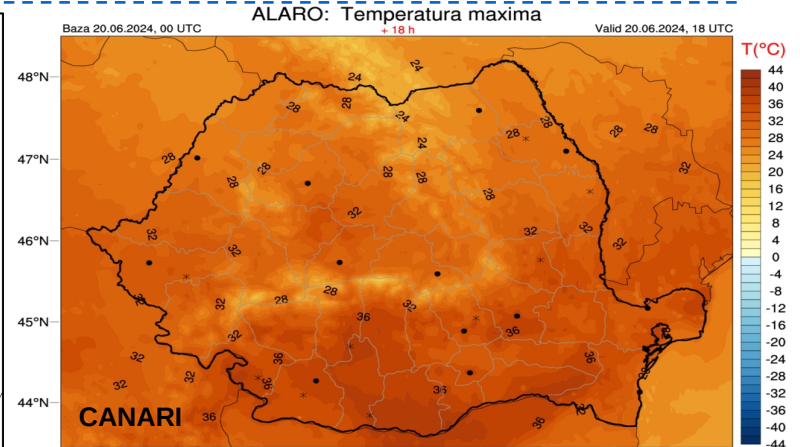Monthly scores: hourly precipitation for 00 UTC and 12 UTC

CANARI scores - June 2024

Monthly scores: t2m (*upper panel*) and rh2m (*lower panel*) for 00 UTC (*left*) and 12 UTC (*right*)

CANARI scores - June 2024

Monthly scores: wind speed at 10m (*upper panel*) and wind gust at 10m (*lower panel*) for 00 UTC (*left*) and 12 UTC (*right*)

Monthly scores: hourly precipitation for 00 UTC and 12 UTC

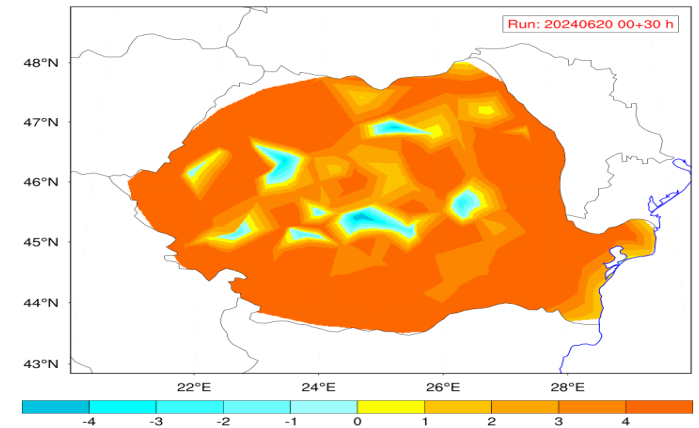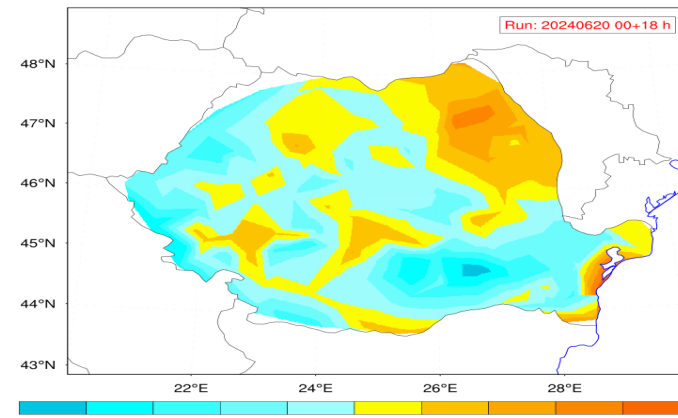Maximum temperature from observation *(left)*, ALARO with CANARI *(upper right)* and ALARO OPER *(lower right)*

Maximum temperature from observation *(left)*, F-O for ALARO with CANARI *(upper right)* and F-O for ALARO OPER *(lower right)*

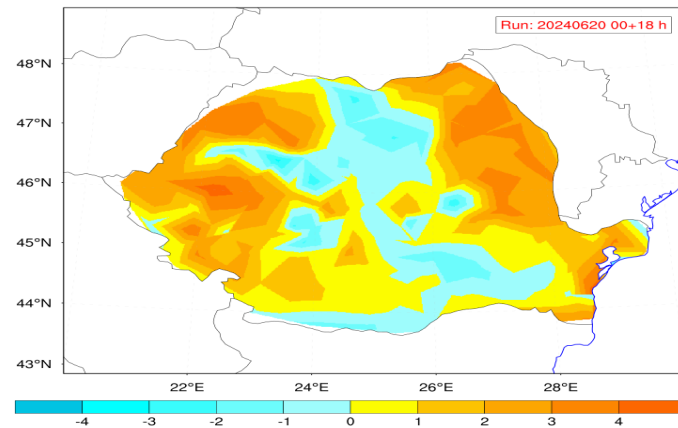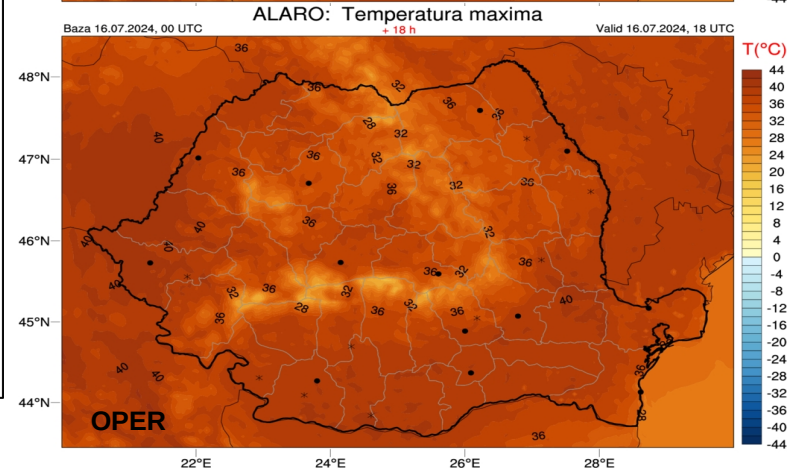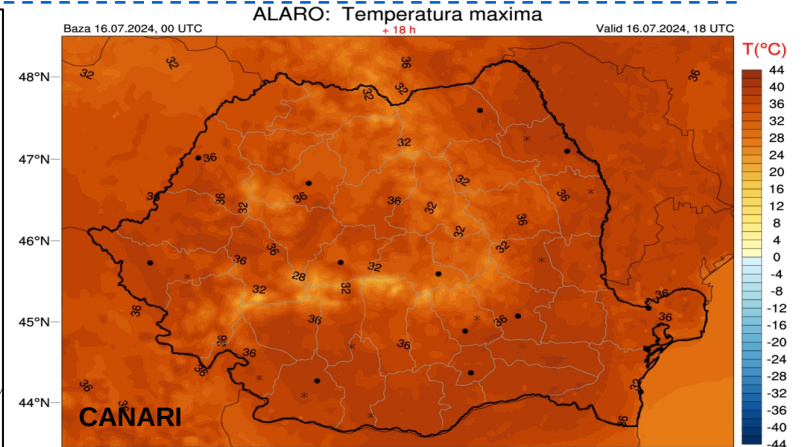Minimum temperature from observation *(left)*, F-O for ALARO with CANARI *(upper right)* and F-O for ALARO OPER *(lower right)*

Maximum temperature from observation *(left)*, ALARO with CANARI *(upper right)* and ALARO OPER *(lower right)*

Maximum temperature from observation *(left)*, F-O for ALARO with CANARI *(upper right)* and F-O for ALARO OPER *(lower right)*
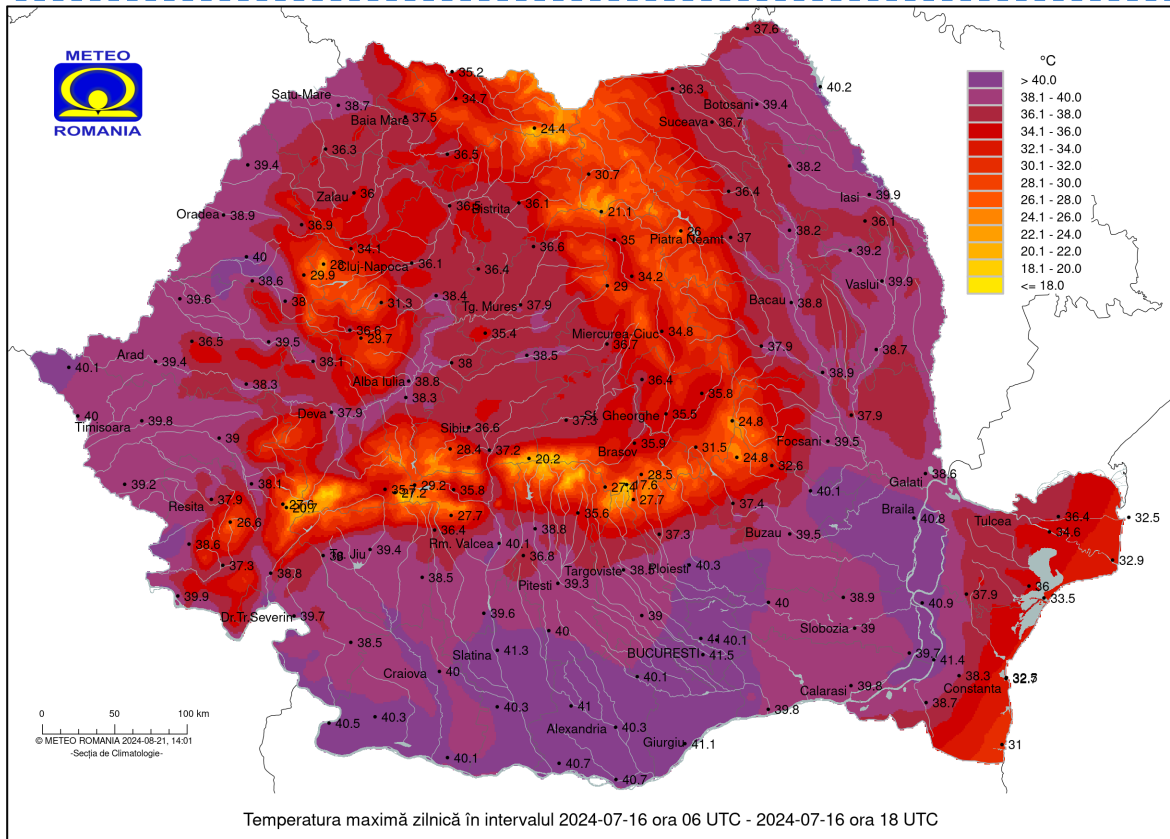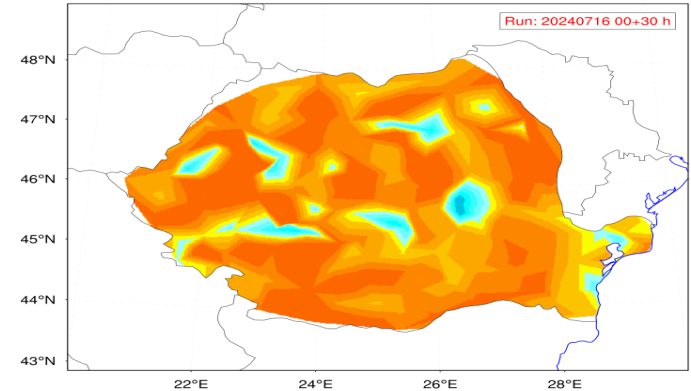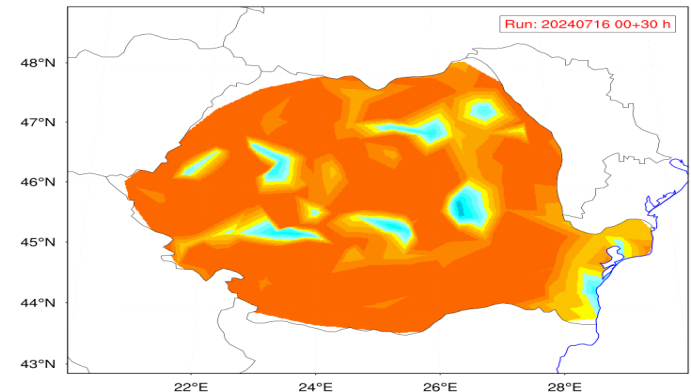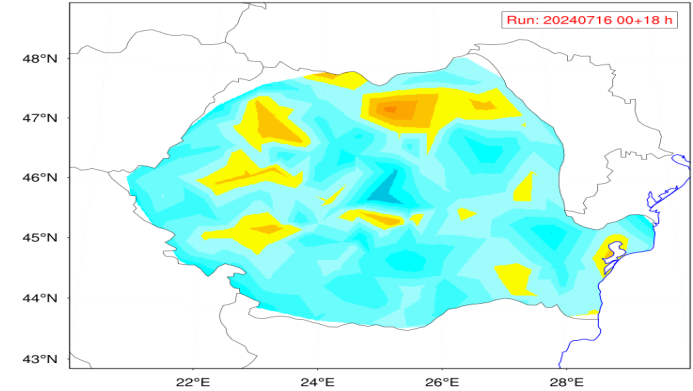
Case study: 16 July 2024
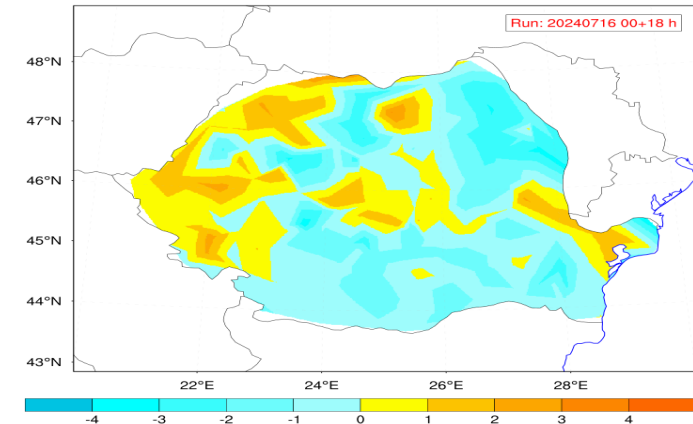

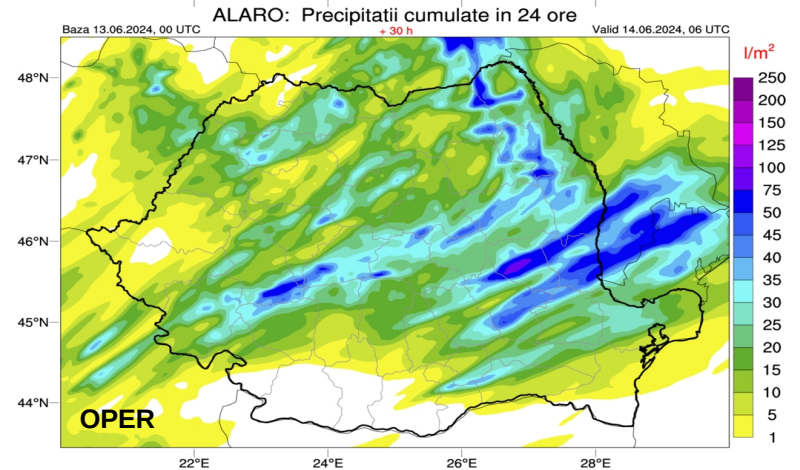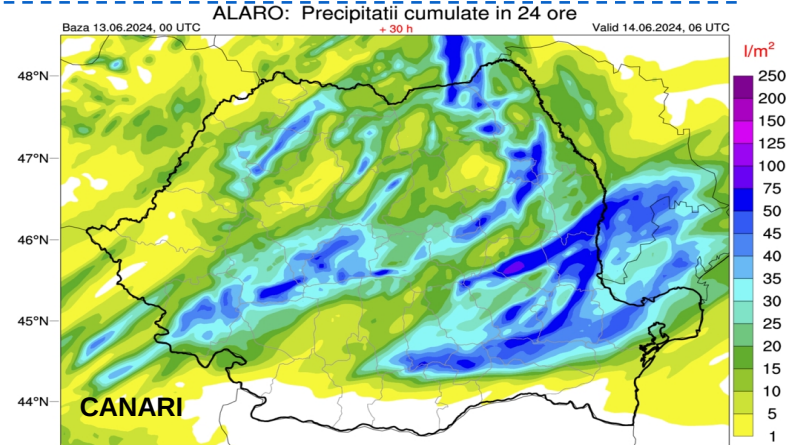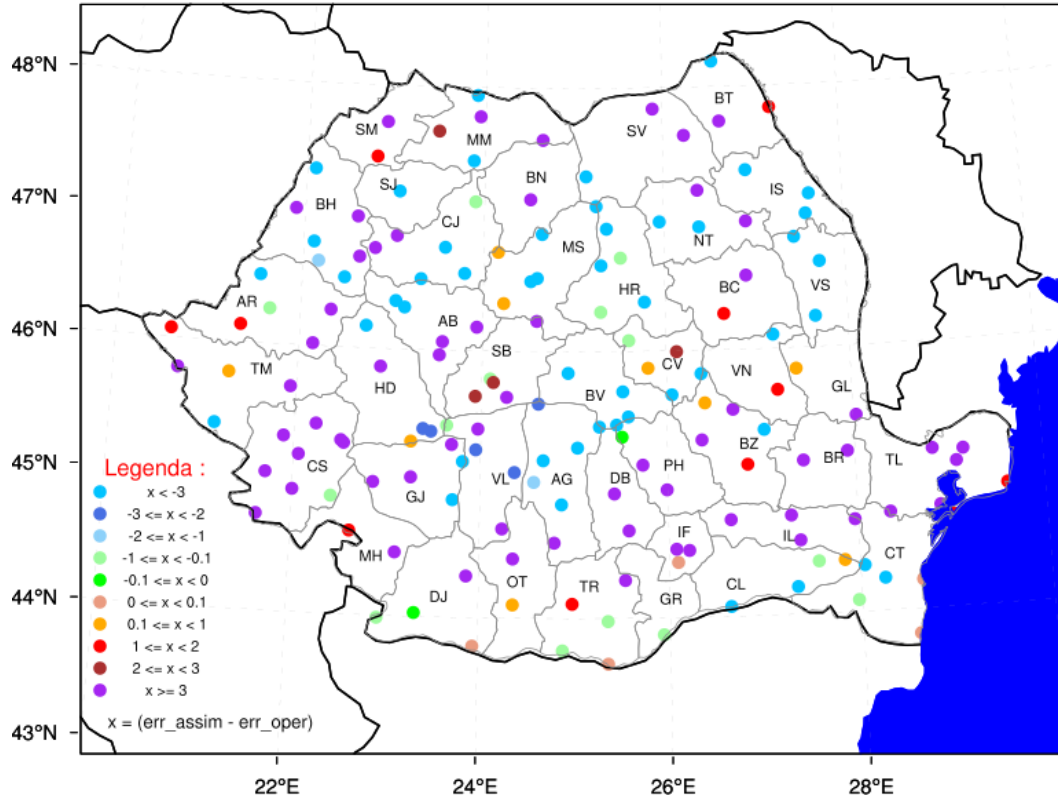Minimum temperature from observation *(left)*, F-O for ALARO with CANARI *(upper right)* and F-O for ALARO OPER *(lower right)*
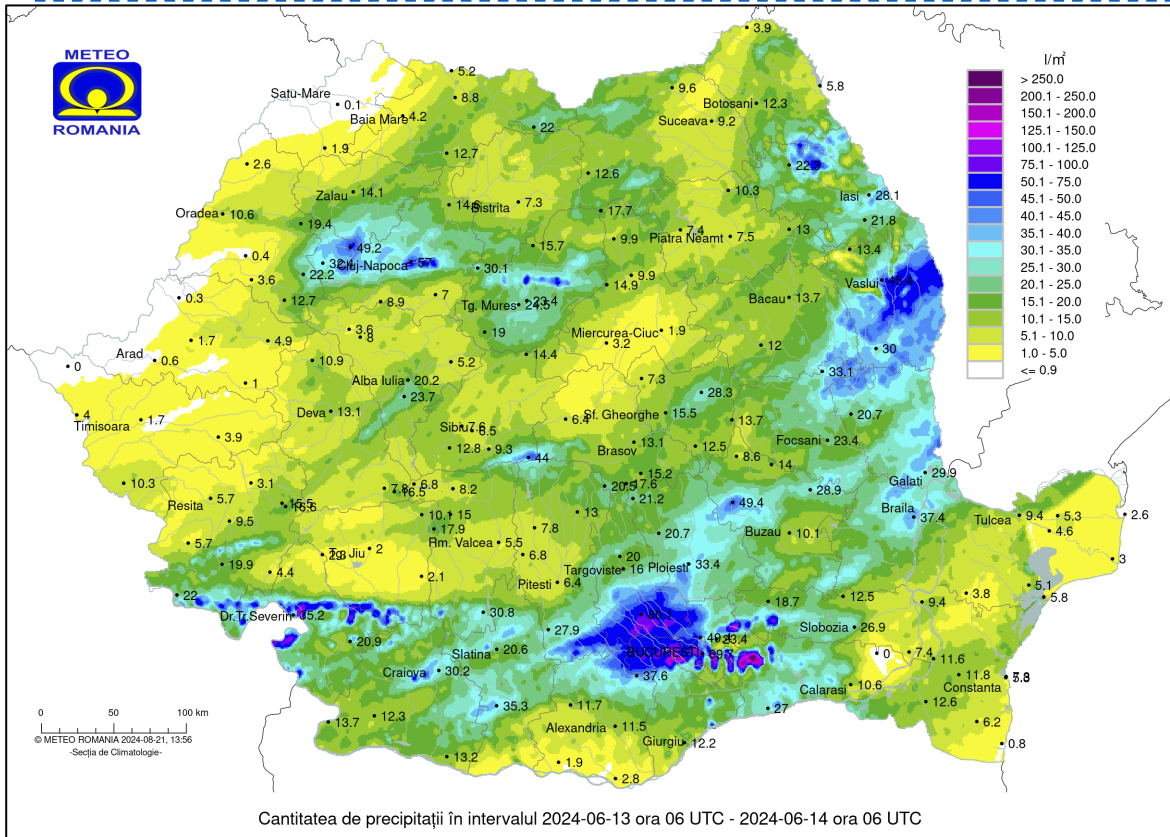
24 hours acumulated precipitation from observation *(left)*, ALARO with CANARI *(upper right)* and F-O for ALARO OPER *(lower right)*

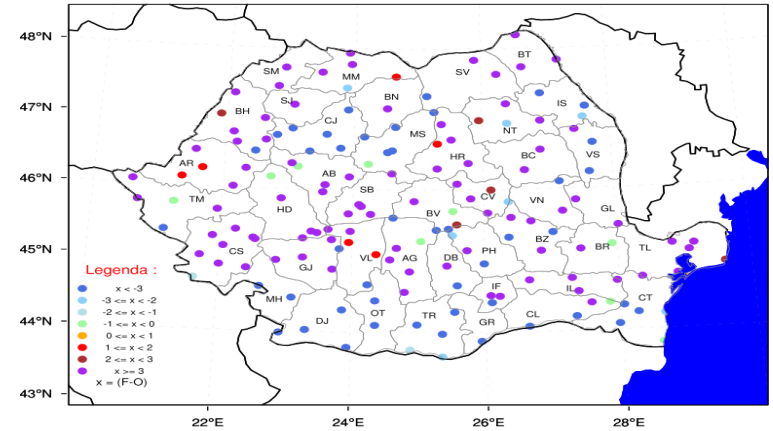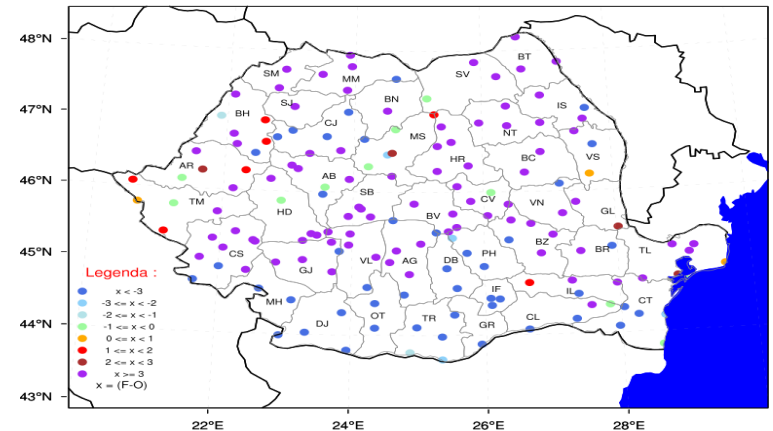Error_assim - Error_oper *(left)*, F-O for ALARO with CANARI *(upper right)* and F-O for ALARO OPER *(lower right)*

Future outlook

- ➤ Check the improvements
- ➤ Continue the implementation of DA system

Regional Cooperation for
Limited Area Modeling in Central Europe

LACE

nwp central europe

Thank you for your attention!

GeoSphere Austria

DHMZ

Czech Hydrometeorological Institute

OMSZ

IMGW

METEO ROMANIA

SHMÚ

ARSO METEO Slovenia