

PP CITTA Applications in NMA

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National Meteorological Administration

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Model Set-Up

- Initial & LBC data from ICON global
- 00UTC run / 48 forecast hours
- Output regular lat/lon grid (grib2)
 - $reg_lon_def = 17.5, 0.025, 32.5$
 - $reg_lat_def = 41.5, 0.025, 50.5$

	res.	IC/LBC	Vert. lev.	dt	ant.
ICON-2.8km	0.025	ICON global	65	24s	78h

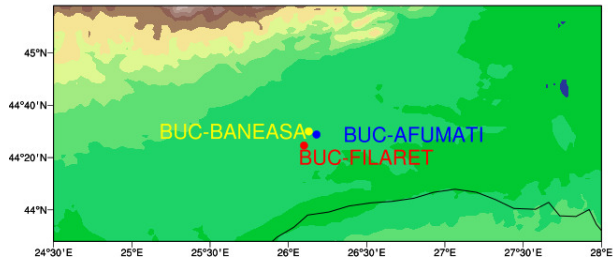
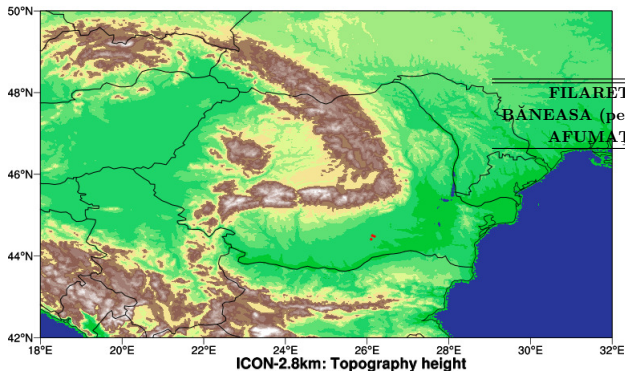
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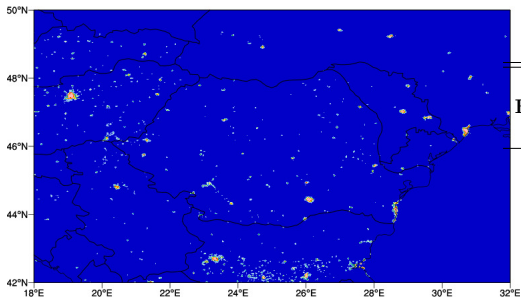
$nv = 3$

$Vertex = 74184$

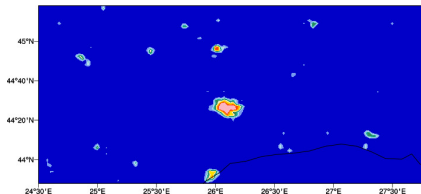
$Mlev = 1$

$nclass_lu = 23$

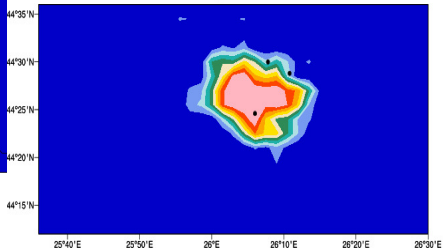


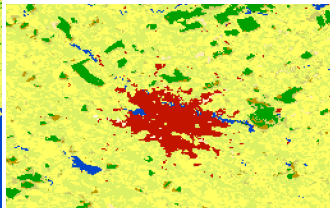
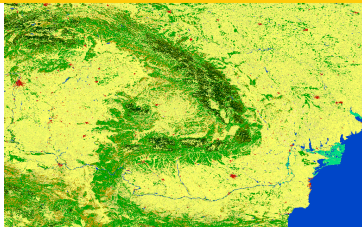


Station	ISA
FILARET (urban)	1
BĂNEASA (peri-urban)	0.273053
AFUMAȚI (rural)	0.228171



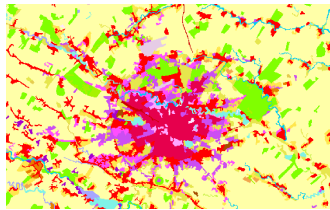
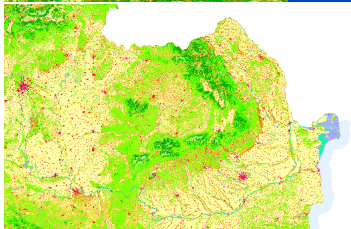
ICON-2.8km: Impervious surface area





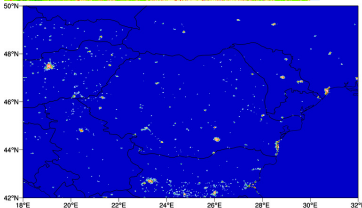
GLC2009

190 Artificial surfaces and associated areas (Urban areas >50%)

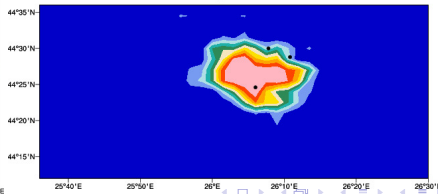


CORINE2018

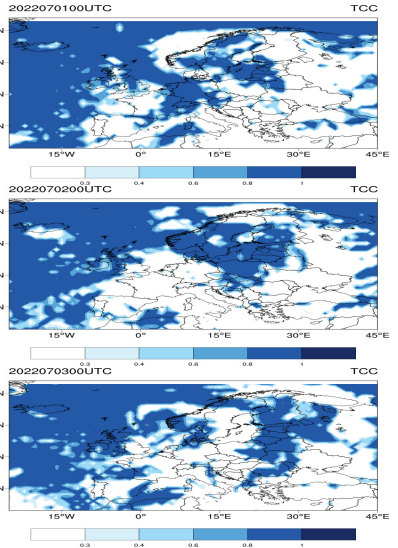
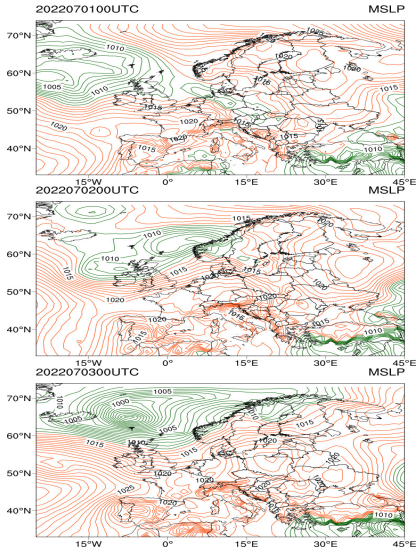
- 111 - Continuous urban fabric
- 112 - Discontinuous urban fabric
- 121 - Industrial or commercial units
- 122 - Road and rail networks and associated infrastructure
- 123 - Port areas
- 124 - Airports
- 131 - Mineral extraction sites
- 132 - Dump sites
- 133 - Construction sites
- 141 - Green urban areas
- 142 - Sport and leisure facilities



ICON-2.8km: Impervious surface area



Synoptic Regimen (1-3 July 2022)



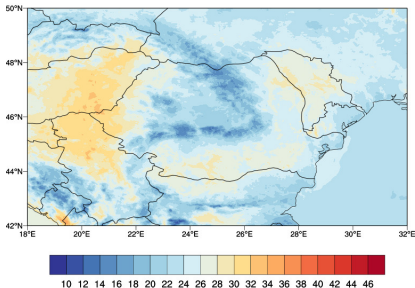
02.07.2022 + 42 hours

ICON-2.8km: 2m Air Temperature

Initial 02.07.2022, 00UTC

+42h

Valid 03.07.2022, 18UTC



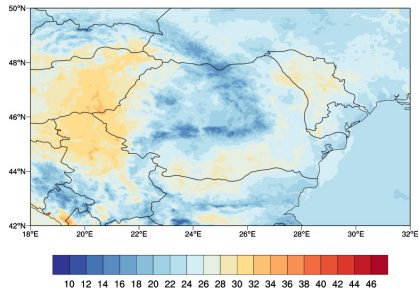
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ICON-2.8km: 2m Air Temperature

Initial 02.07.2022, 00UTC

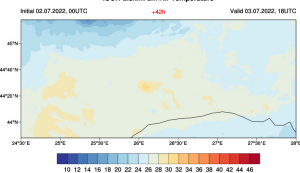
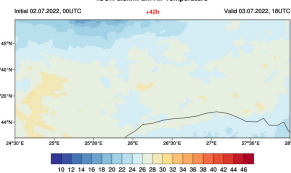
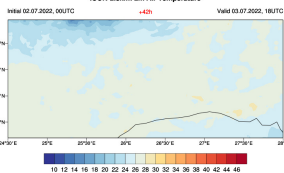
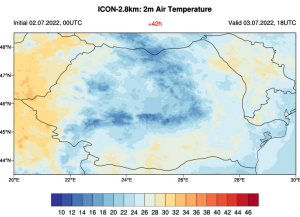
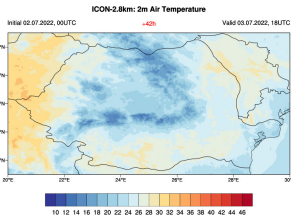
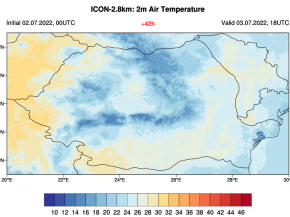
+42h

Valid 03.07.2022, 18UTC



`lterra_urb=.true.`

02.07.2022 + 42 hours



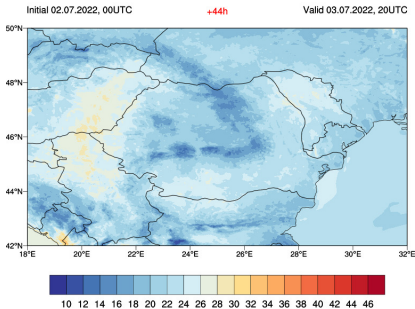
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terra_urb=.true.

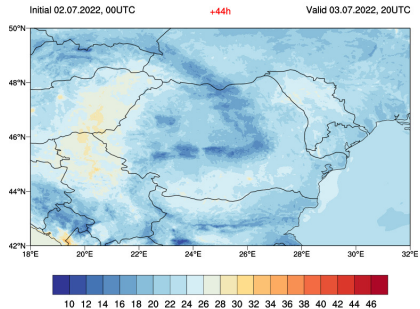
02.07.2022 + 44 hours

ICON-2.8km: 2m Air Temperature



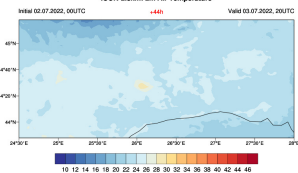
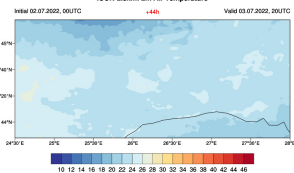
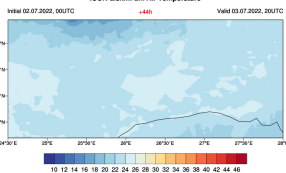
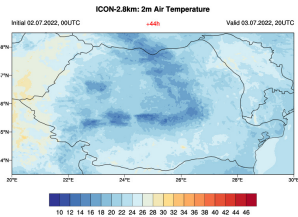
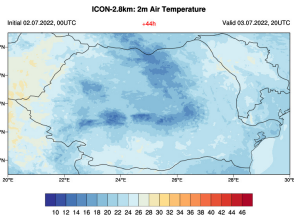
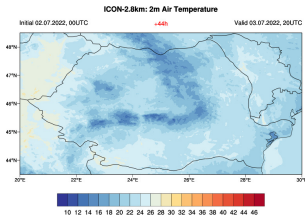
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ICON-2.8km: 2m Air Temperature



`lterra_urb=.true.`

02.07.2022 + 44 hours

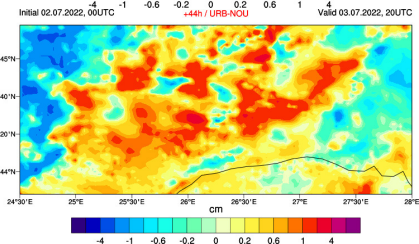
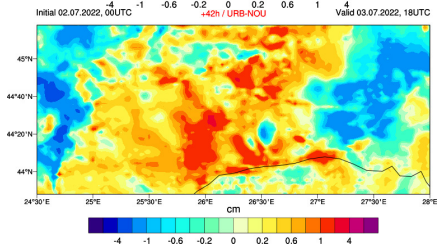
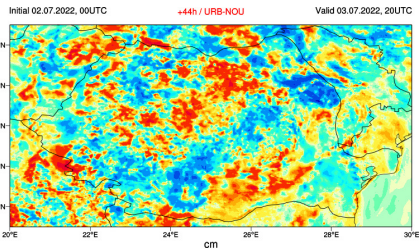
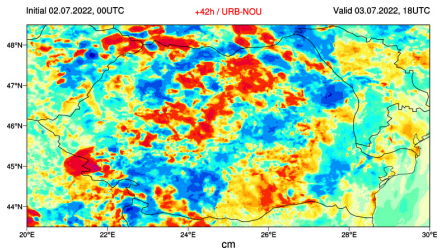


oper

lterra_urb=.false.

lterra_urb=.true.

$$\Delta T_{2m} (lterra_urb : true - false)$$



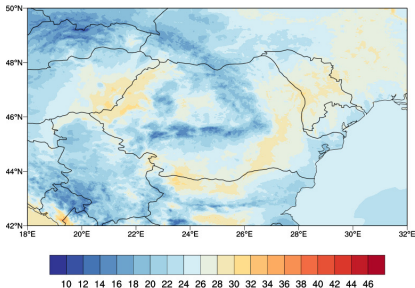
05.07.2022 + 18 hours

ICON-2.8km: 2m Air Temperature

Initial 05.07.2022, 00UTC

+18h

Valid 05.07.2022, 18UTC



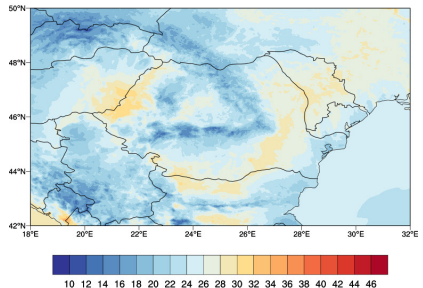
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ICON-2.8km: 2m Air Temperature

Initial 05.07.2022, 00UTC

+18h

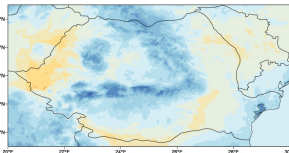
Valid 05.07.2022, 18UTC



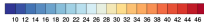
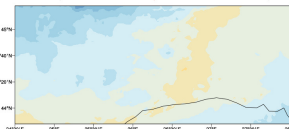
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05.07.2022 + 18 hours

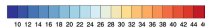
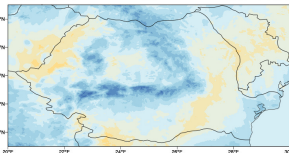
ICON-2.8km: 2m Air Temperature
Initial 05.07.2022, 00UTC +18h Valid 05.07.2022, 18UTC



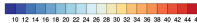
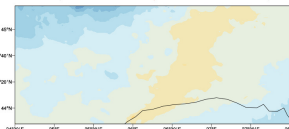
ICON-2.8km: 2m Air Temperature
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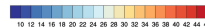
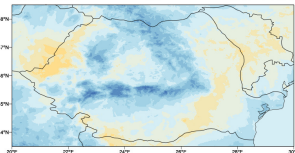
ICON-2.8km: 2m Air Temperature
Initial 05.07.2022, 00UTC +18h Valid 05.07.2022, 18UTC



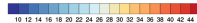
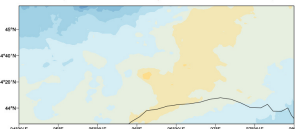
ICON-2.8km: 2m Air Temperature
Initial 05.07.2022, 00UTC +18h Valid 05.07.2022, 18UTC



ICON-2.8km: 2m Air Temperature
Initial 05.07.2022, 00UTC +18h Valid 05.07.2022, 18UTC



ICON-2.8km: 2m Air Temperature
Initial 05.07.2022, 00UTC +18h Valid 05.07.2022, 18UTC

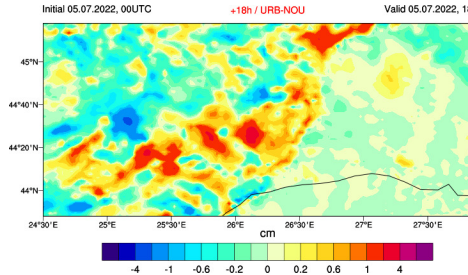
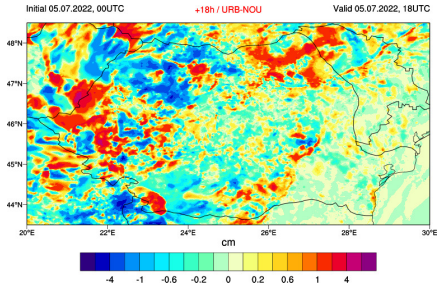


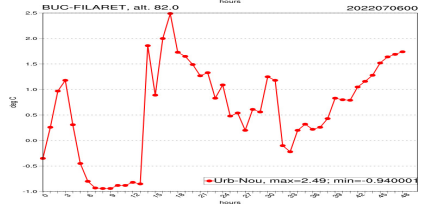
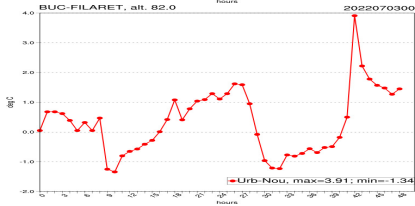
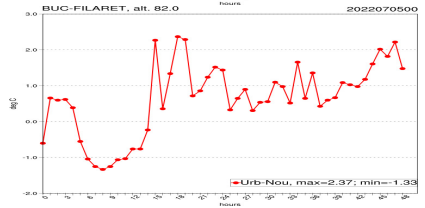
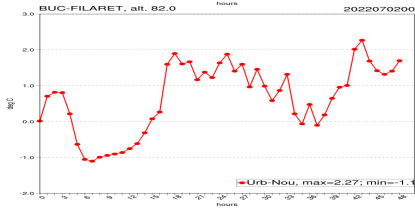
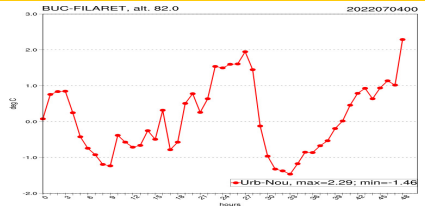
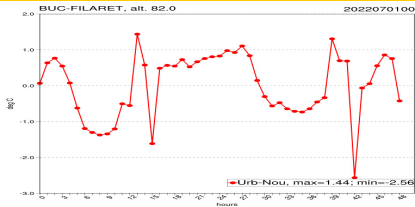
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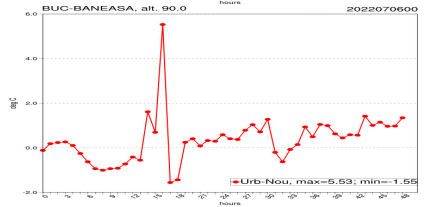
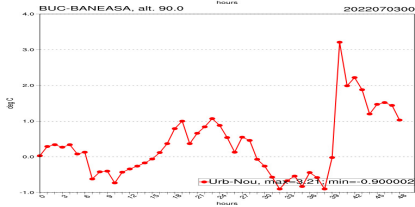
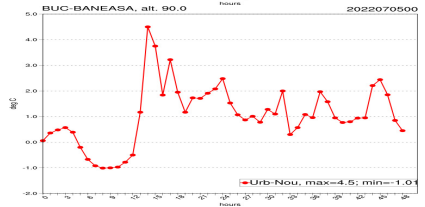
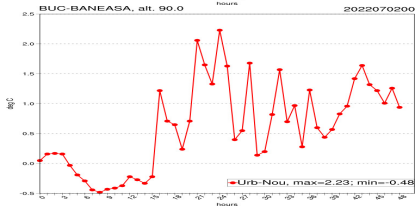
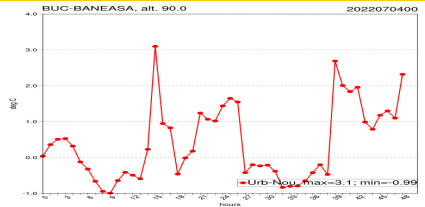
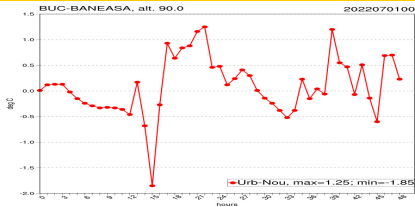
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$$\Delta T_{2m} (l_{terra_urb} : true - false)$$

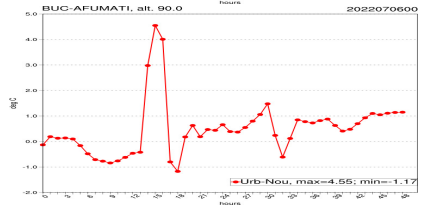
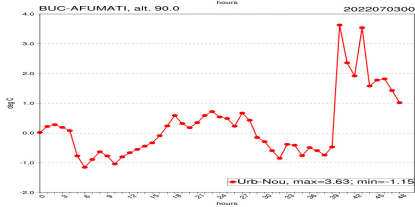
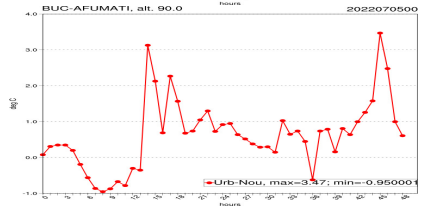
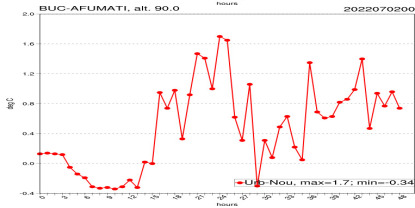
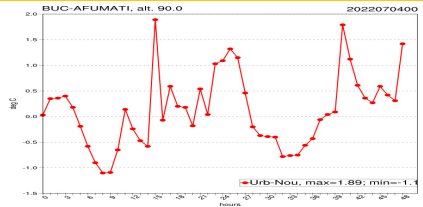
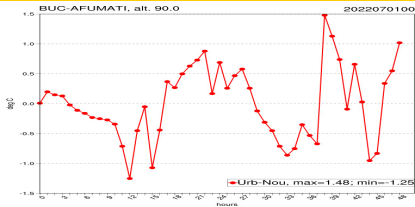




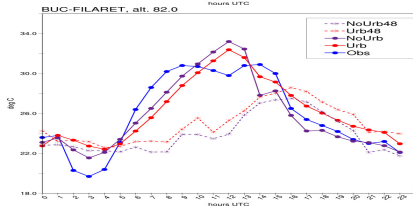
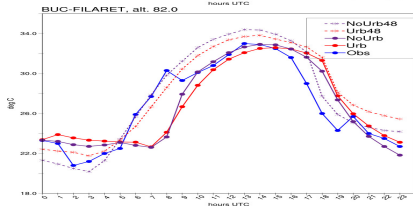
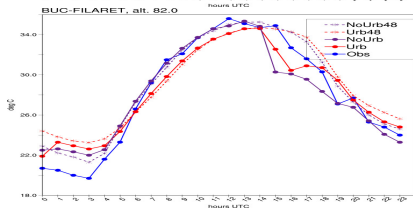
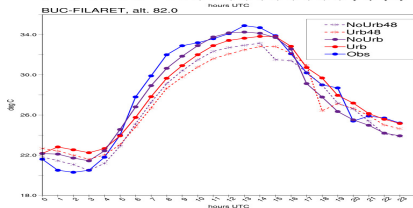
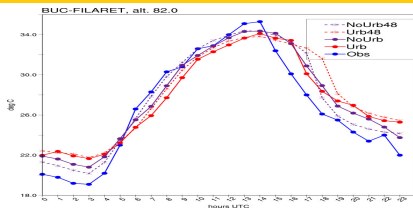
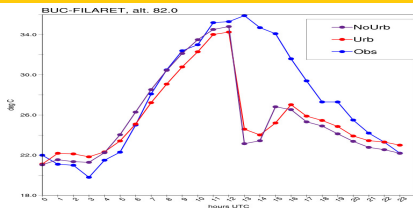
Filaret (urban): ΔT_{2m} (lterra_urb: true – false)



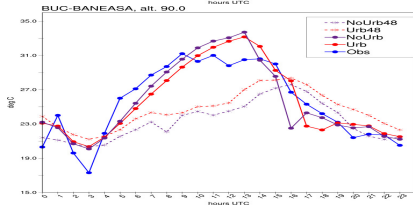
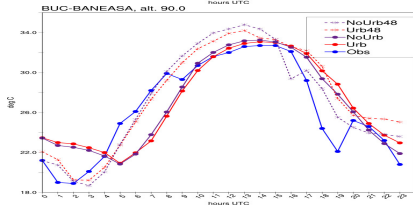
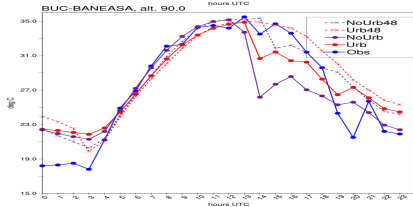
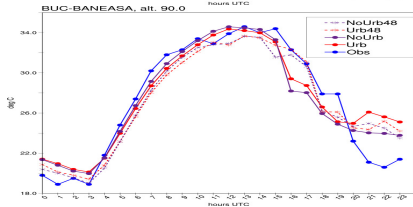
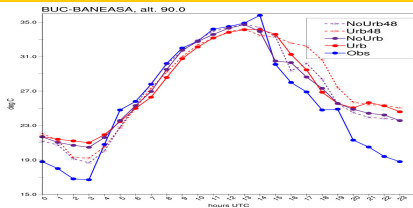
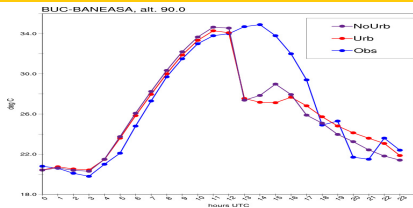
Băneasa (peri-urban): ΔT_{2m} (lterra_urb : true – false)



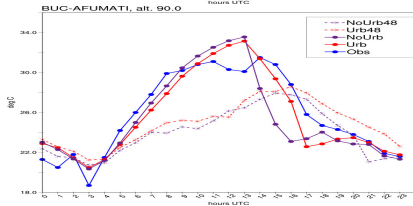
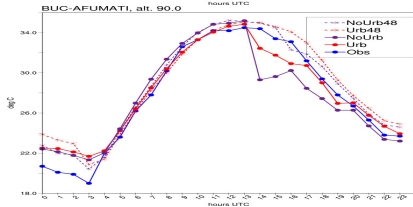
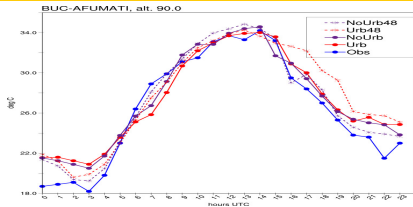
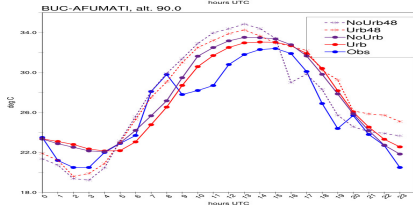
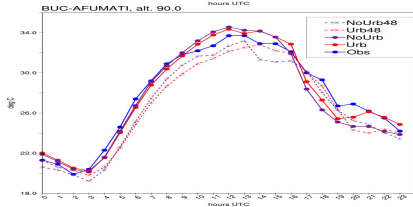
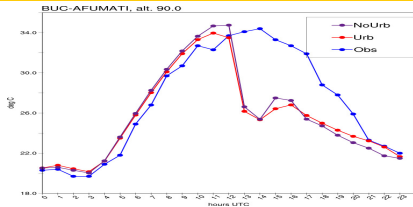
Afumați (rural): ΔT_{2m} (lterra_urb: true – false)



Filaret (urban): model vs. observations

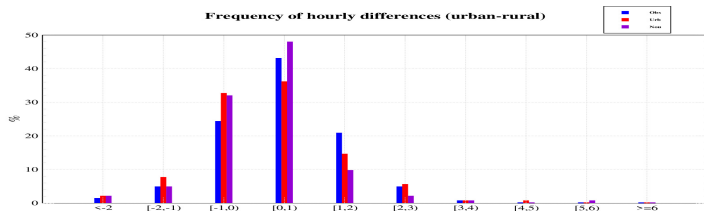


Băneasa (peri-urban): model vs. observations

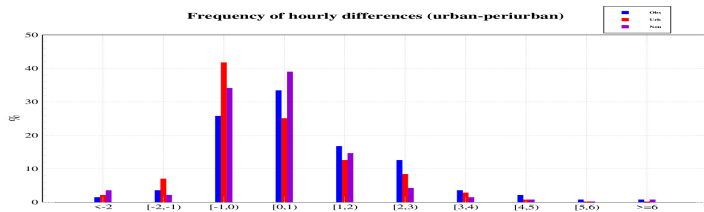


Afumați (rural): model vs. observations

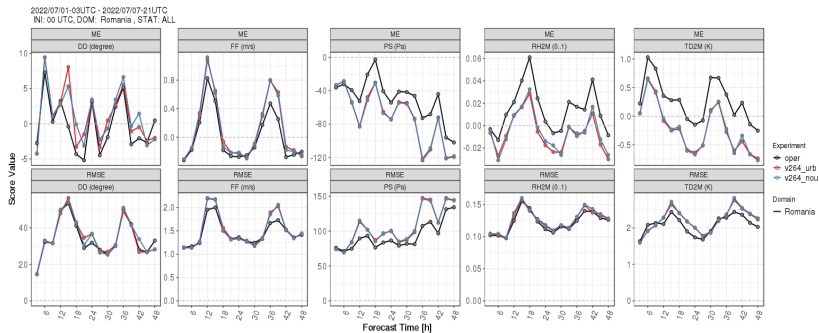
Filaret (urban) - Afumați (rural): obs., v264_urb, v264_nou



Filaret (urban) - Băneasa (peri-urban)

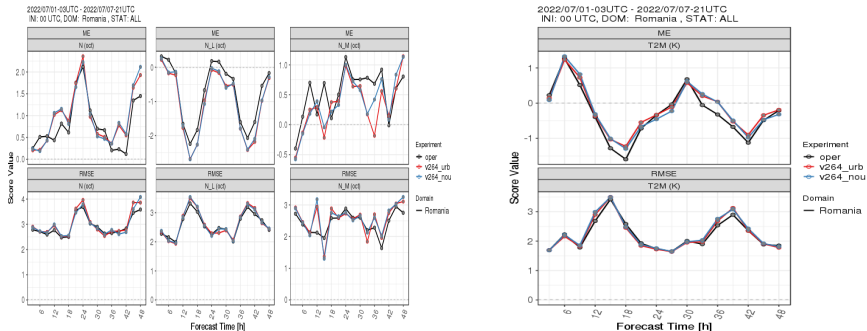


Statistical scores (1-6 July 2022)



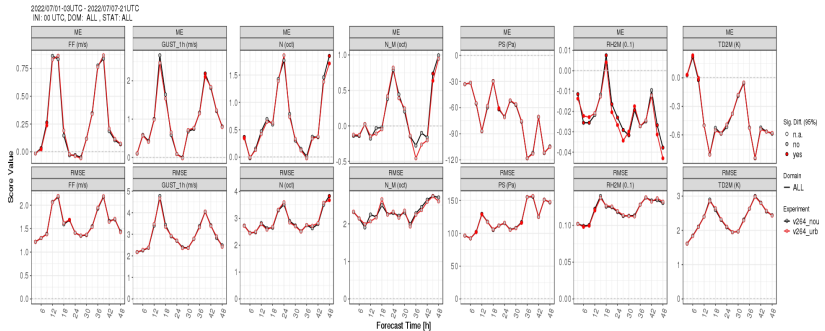
obs., **v264_urb**, **v264_nou**

Statistical scores (1-6 July 2022)



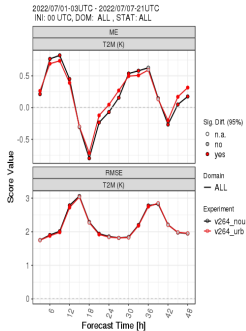
obs., **v264_urb**, **v264_nou**

Statistical scores (1-6 July 2022)

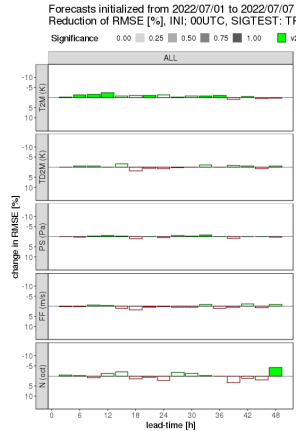
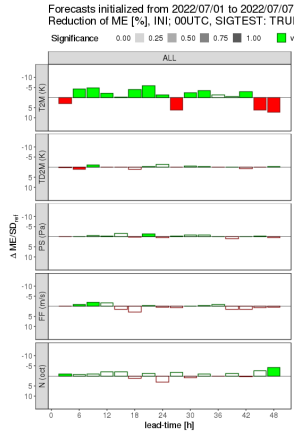


v264_urb, v264_nou

Statistical scores (1-6 July 2022)

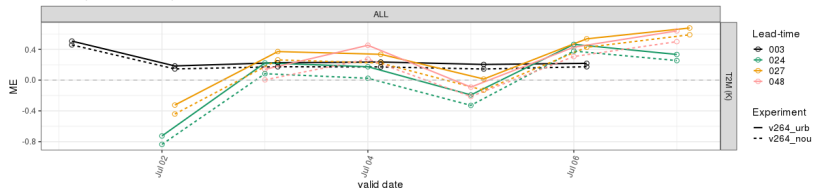


v264_urb, v264_nou

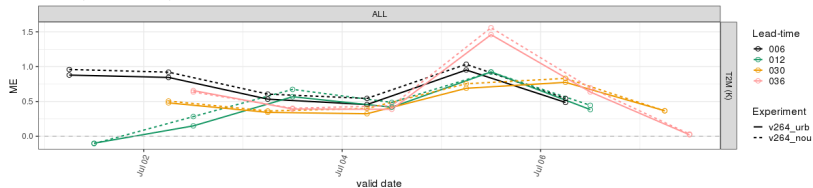


v264_urb - better v264_nou - better

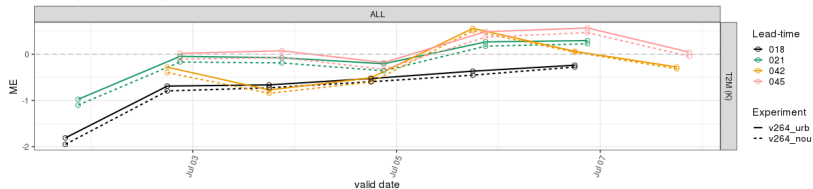
2022.07.01-03UTC - 2022.07.07-21UTC
INI: 00 , DOMAIN: ALL , STATIONS: ALL



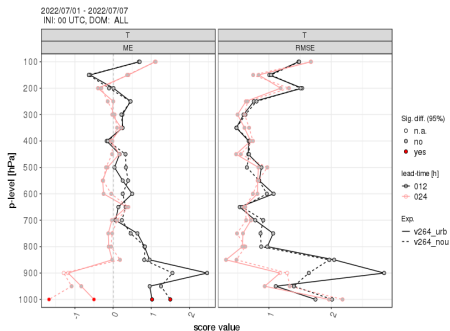
2022.07.01-03UTC - 2022.07.07-21UTC
INI: 00 , DOMAIN: ALL , STATIONS: ALL



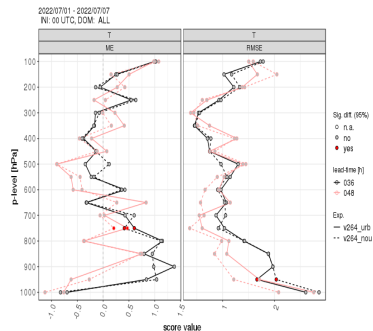
2022.07.01-03UTC - 2022.07.07-21UTC
INI: 00 , DOMAIN: ALL , STATIONS: ALL



Statistical scores (1-6 July 2022)



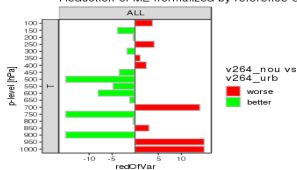
+12, +24



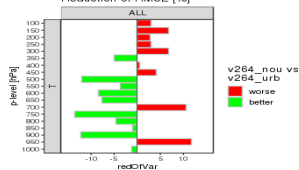
+36, +48

Statistical scores (1-6 July 2022)

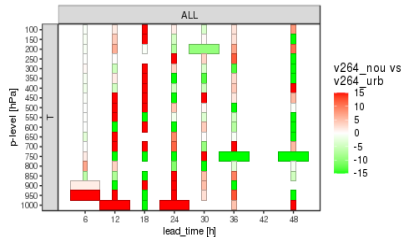
Verification period: 2022/07/01 - 2022/07/07
Data selection by initial-date
Reduction of ME normalized by reference SD



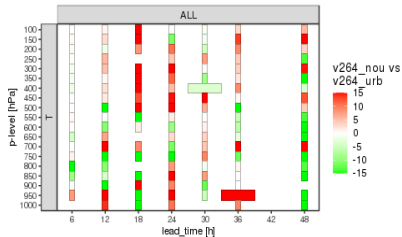
Verification period: 2022/07/01 - 2022/07/07
Data selection by initial-date
Reduction of RMSE [%]



Verification period: 2022/07/01 - 2022/07/07
INI: 00UTC, SIGN. TEST: TRUE
Data selection by initial-date
Reduction of ME normalized by reference SD



Verification period: 2022/07/01 - 2022/07/07
INI: 00UTC, SIGN. TEST: TRUE
Data selection by initial-date
Reduction of RMSE [%]



v264_urb - better v264_nou - better

Near Future Actions

Tests for a more representative period of time (more intense UHI).

Configure and test ICON-RO_1km resolution.

Thank you!

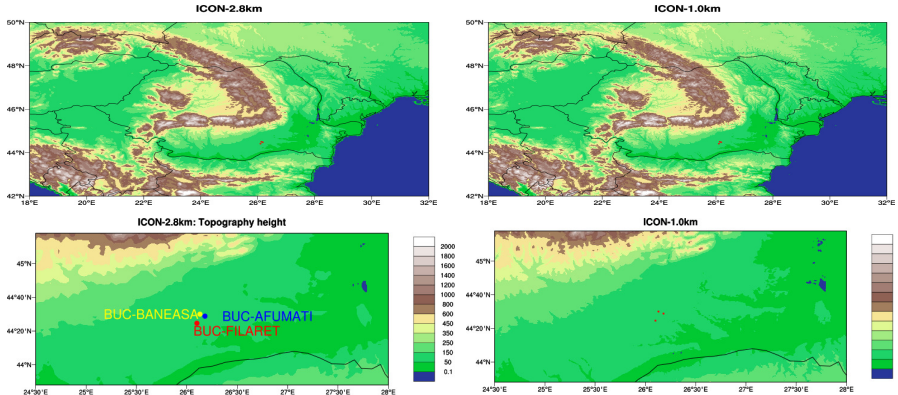
Near Future Actions

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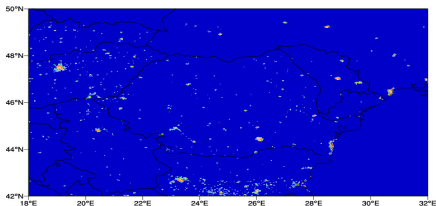
Thank you!

Outlook $\approx 1\text{km}$ (topography)

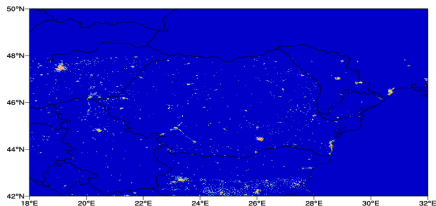
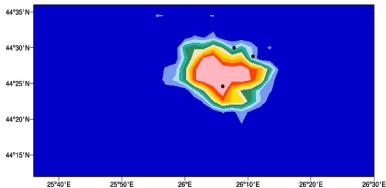


Station	Elevation (in m)				
	Real	Model-2.8	Diff.(2p8)	Model-2.8	Diff.(1p0)
FILARET (urban)	82.0	90.37	8.37	81.048	-0.952
BĂNEASA (peri-urban)	90.0	86.50	-3.5	85.7078	-4.2922
AFUMATI (rural)	90.0	84.40	-5.6	83.2079	-6.7921

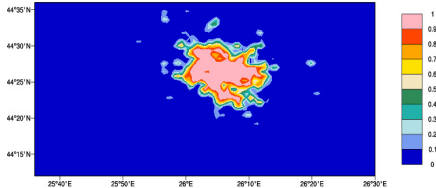
Outlook $\approx 1\text{km}$ (ISA)



ICON-2.8km: Impervious surface area



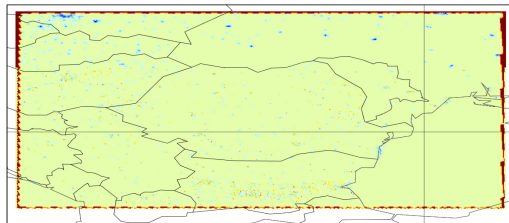
ICON-1.0km



Station	ISA
FILARET (urban)	1
BĂNEASA (peri-urban)	0.273053
AFUMAȚI (rural)	0.228171

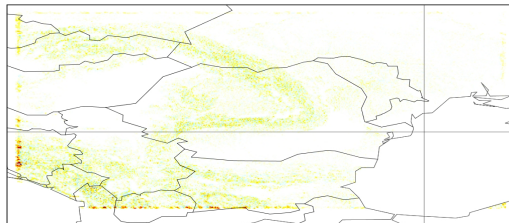
Outlook $\approx 1\text{km}$ (difference)

ISA difference



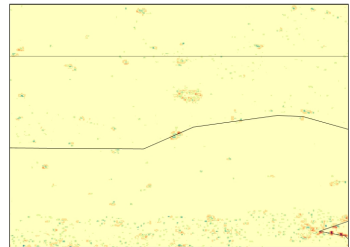
-1.00000 -0.60000 -0.20000 0.20000 0.60000 1.00000

Topography difference

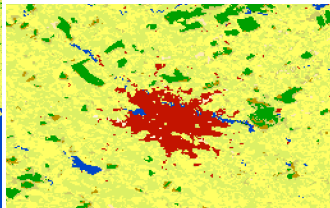
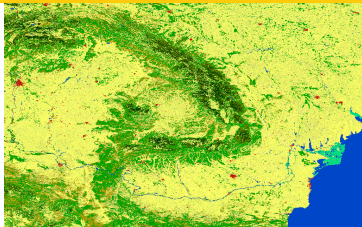


-700 -525 -350 -175 0 175 350 525 700

ISA difference

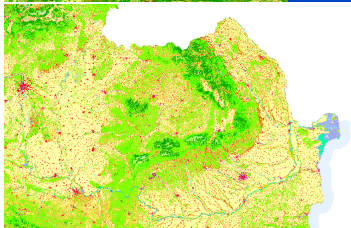


-1.00000 -0.60000 -0.20000 0.20000 0.60000 1.00000



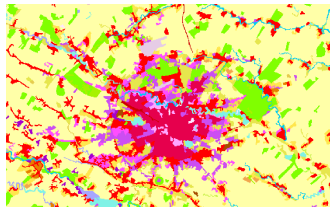
GLC2009

190 Artificial surfaces and associated areas (Urban areas >50%)



CORINE2018

- 111 - Continuous urban fabric
- 112 - Discontinuous urban fabric
- 121 - Industrial or commercial units
- 122 - Road and rail networks and associated infrastructure
- 123 - Port areas
- 124 - Airports
- 131 - Mineral extraction sites
- 132 - Dump sites
- 133 - Construction sites
- 141 - Green urban areas
- 142 - Sport and leisure facilities



ICON-1.0km

