

# **Soil Wetness Index diagnostics for ALADIN initial conditions**

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LACE DA WD 14-16 June, 2011  
Budapest

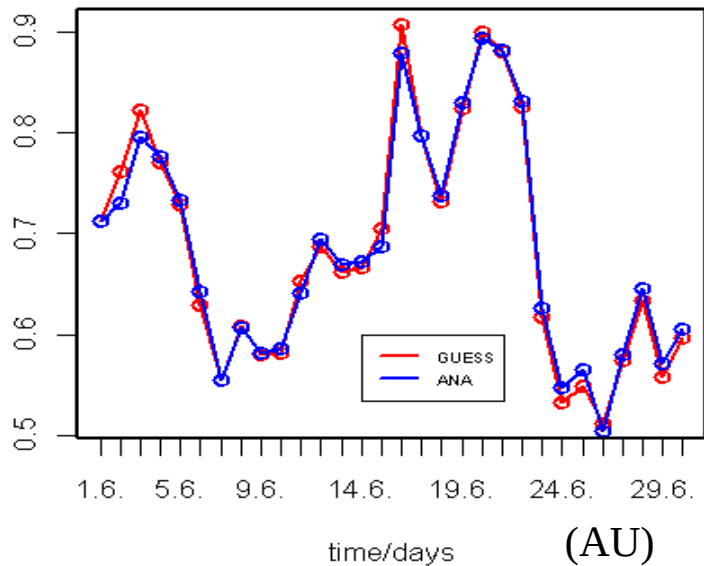
# Motivation

- Previous working days: CRO 2m RH scores for July 2010 seemed to be degraded by CANARI surface assimilation (too much moistening)
- Tests proposed to evaluate how assimilation (CANARI and 3DVAR) acts on the soil moisture
- For June 2010 SWI was plotted for different fields:
  - AU, HU, CRO: global IC (LBC), local guess, analysis of CANARI + 3DVAR
  - CZ: local guess and analysis of BlendCan and BlendVar
  - CRO, CZ, HU also plotted 2m scores to see the impact of the soil moisture change

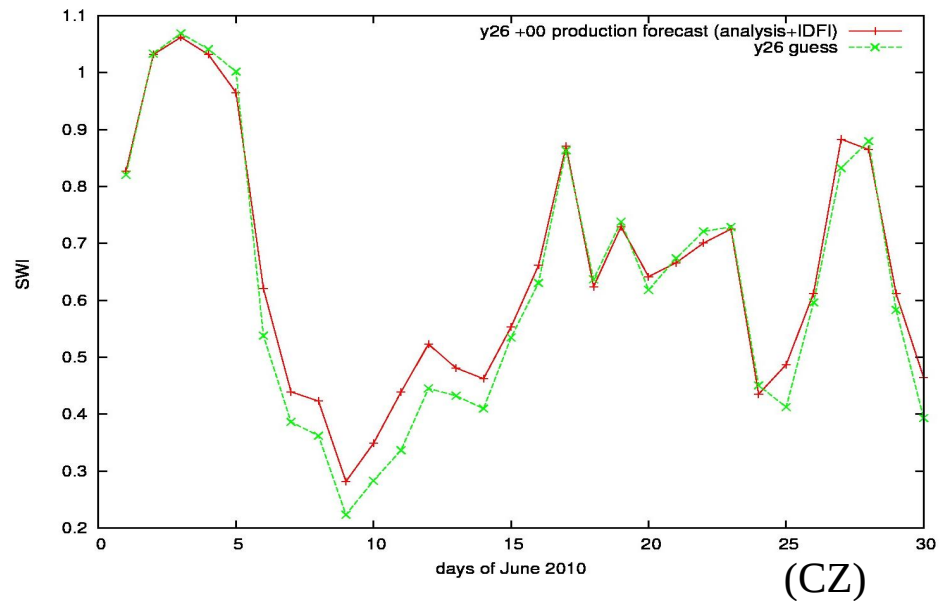
# Findings (1)

- No bias in the analysis procedure (3DVAR or CANARI): the assimilation sometimes dries sometimes moistens the guess

SWI at Ljubljana June 2010



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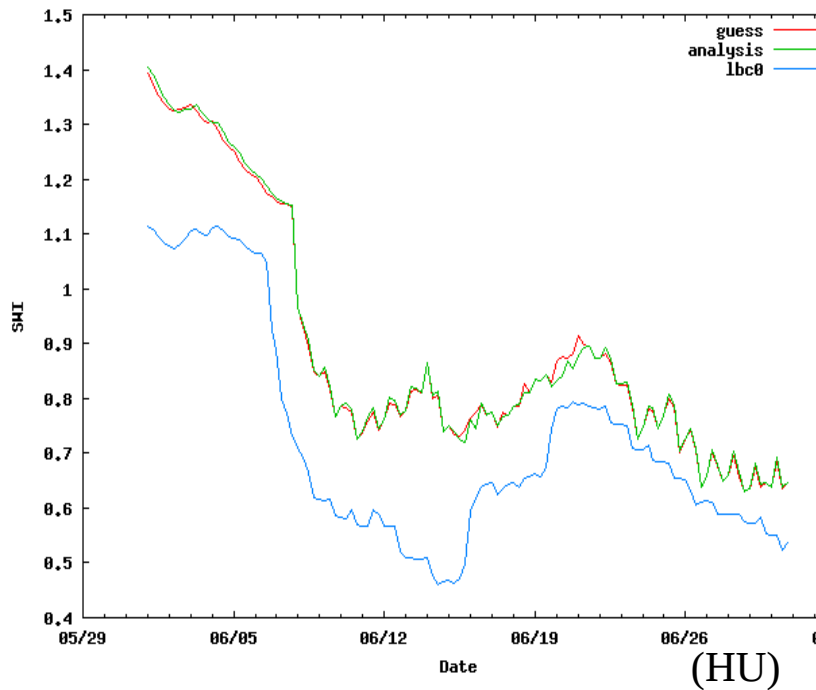


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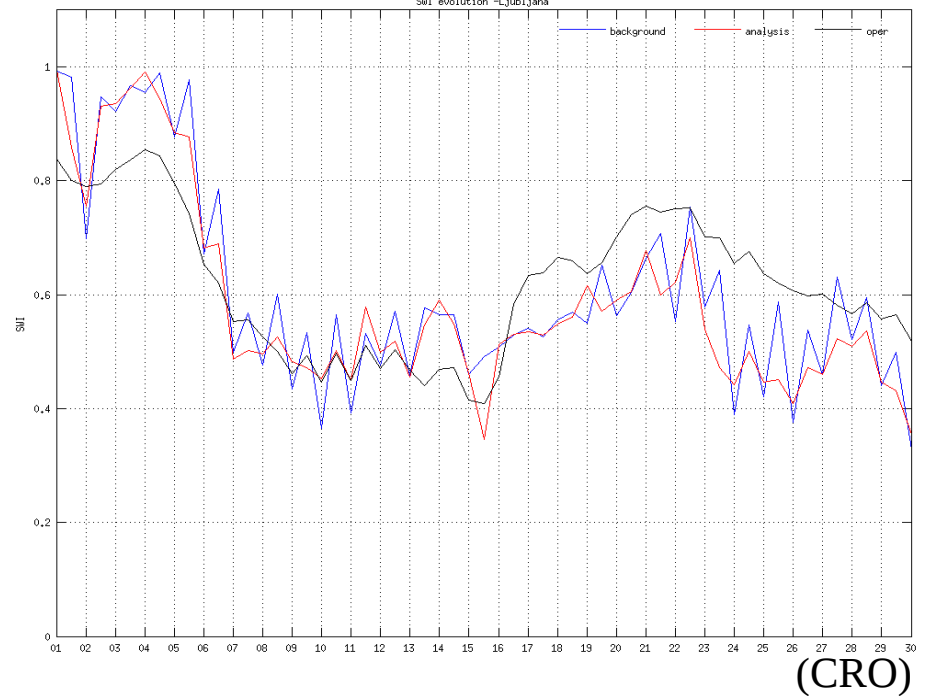
# Findings(2)

- SWI in the global ICs are rather different from those in the analysis/guess

Evolution of SWI in Ljubljana



SWI evolution -Ljubljana

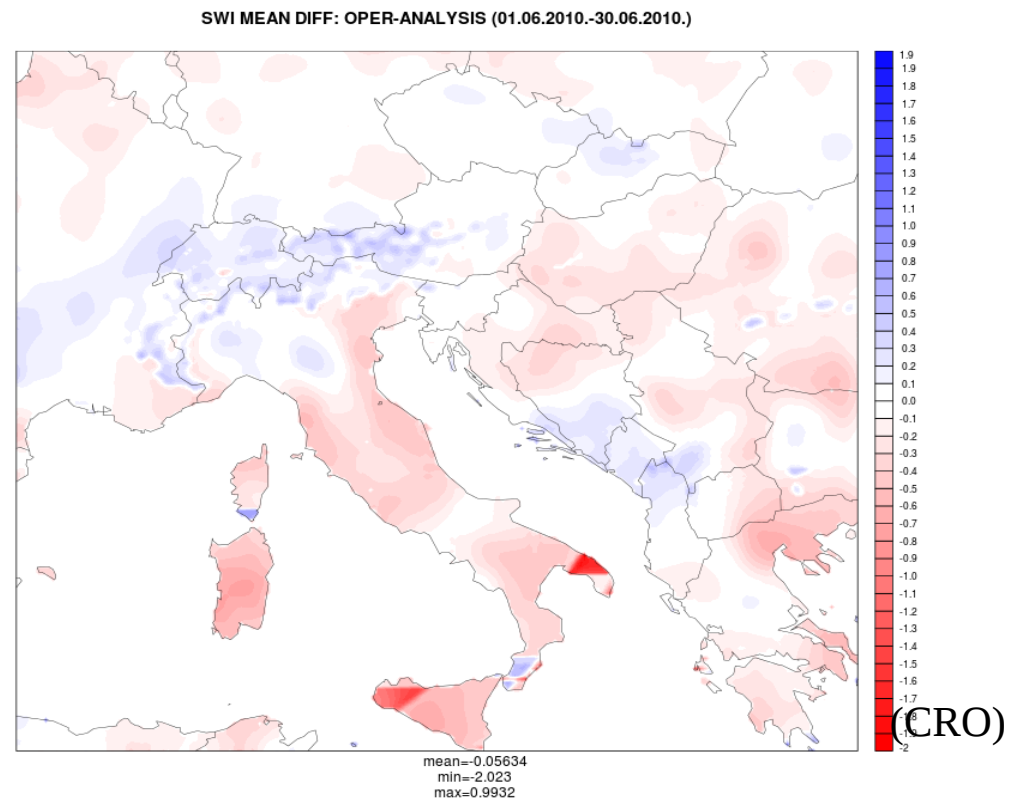


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# Findings(3)

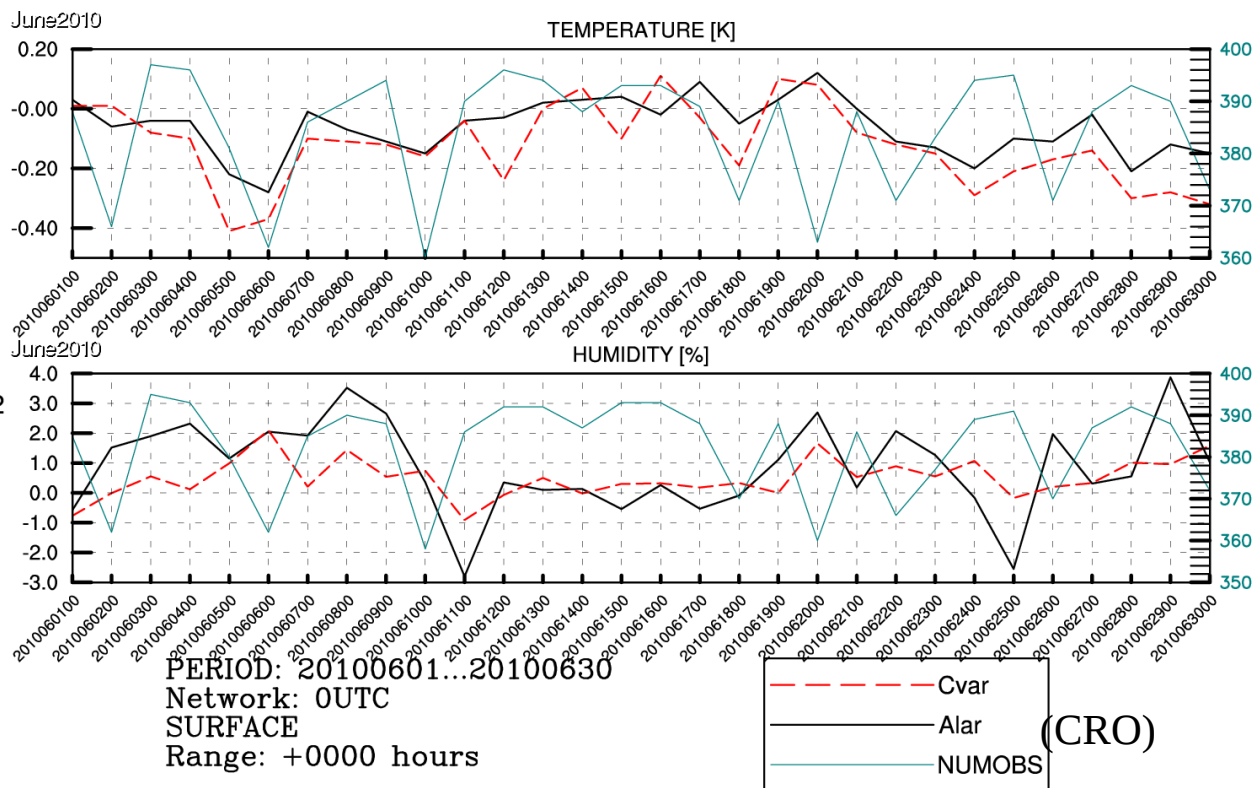
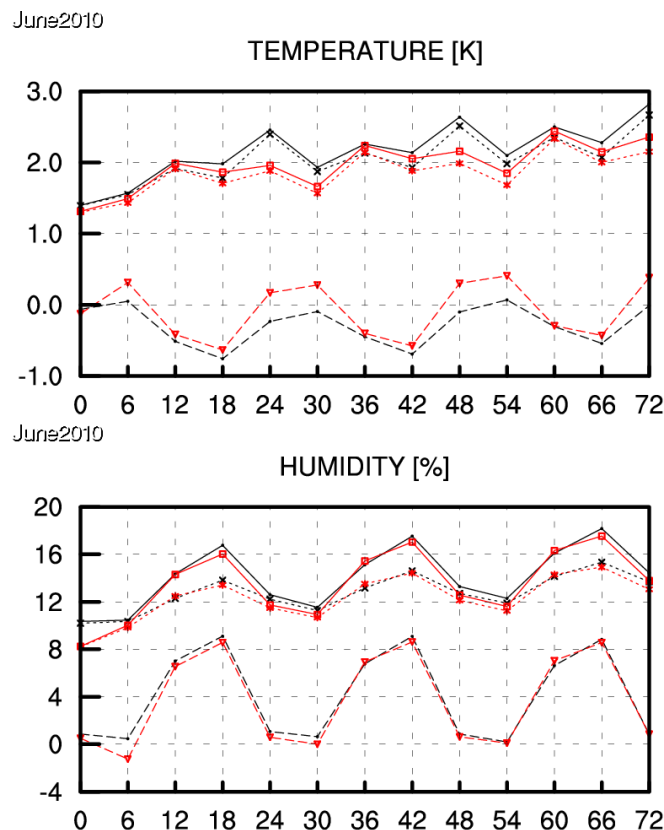
- On average there is a moistening of the soil by assimilation and mostly in the south (compared to the global ICs)

Mean SWI difference:  
Blue: assimilation is dryer  
Red: assimilation is moister



# Findings(4)

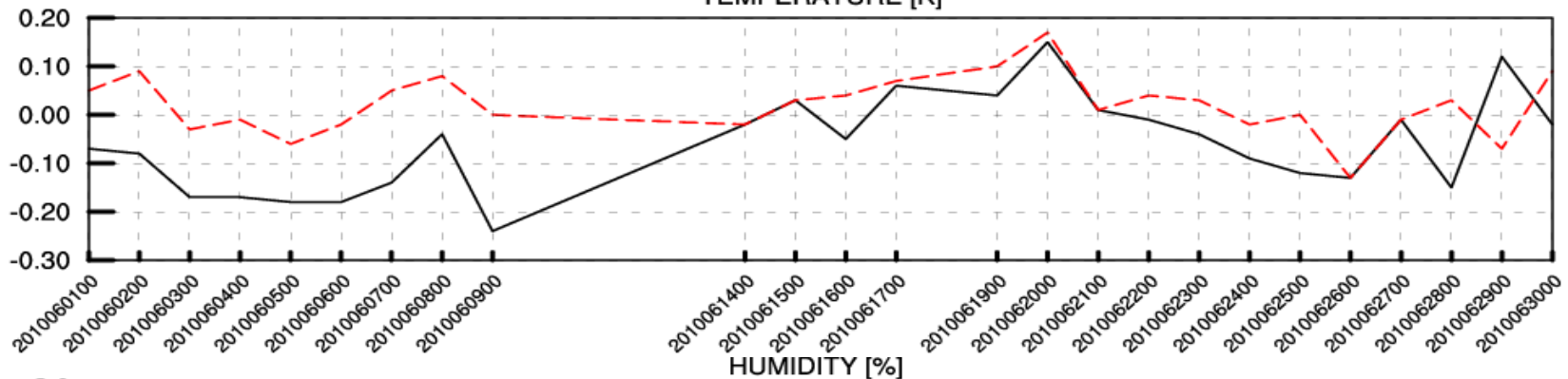
- 3DVAR+CANARI „dries” and „heats” the 2m
- This means an improvement for 2m RH
- Not clearly improvement for 2m T



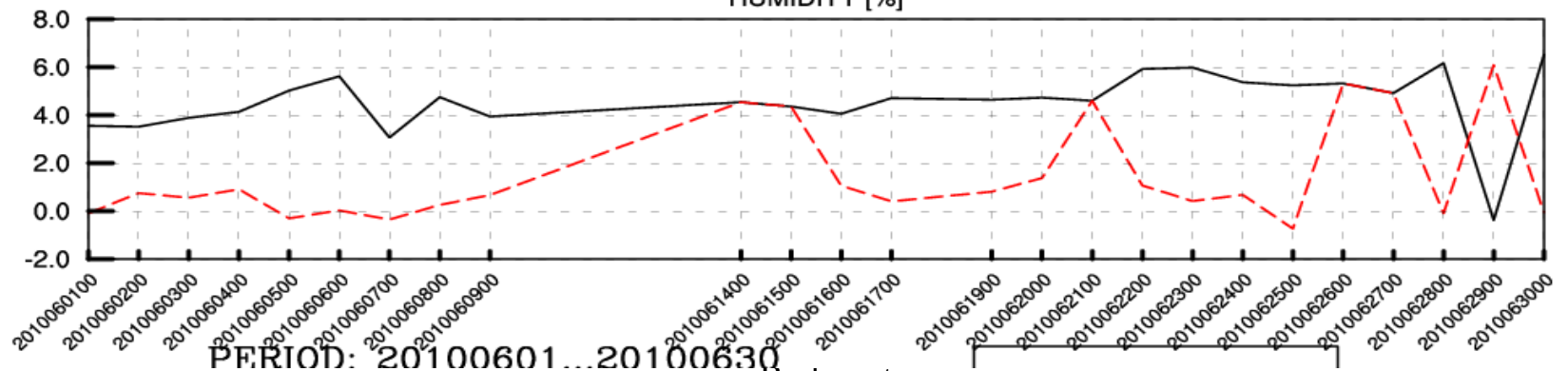
# Findings(4)

- 3DVAR+CANARI „dries” and „heats” the 2m
- This means an improvement for 2m RH
- Not clearly improvement for 2m T

TEMPERATURE [K]



HUMIDITY [%]



PERIOD: 20100601...20100630

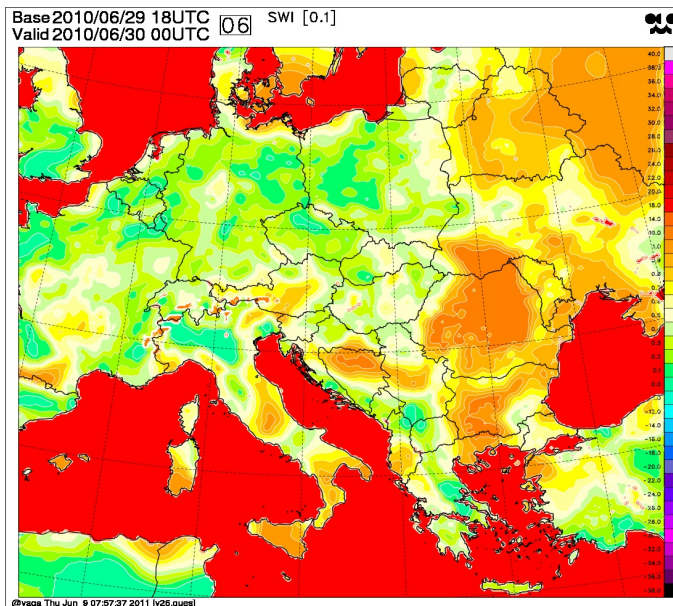
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(HU)

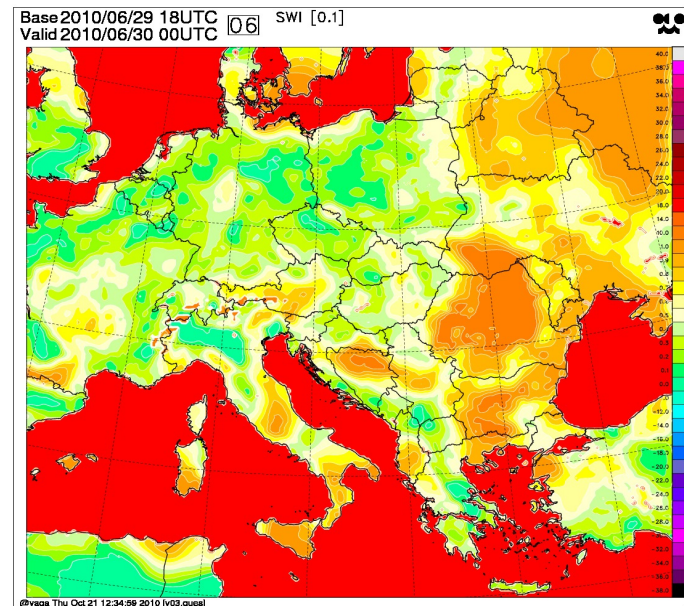
# Findings(5)

- 3DVAR alone dries a bit the soil

BlendCan guess at last day



BlendVar guess at last day

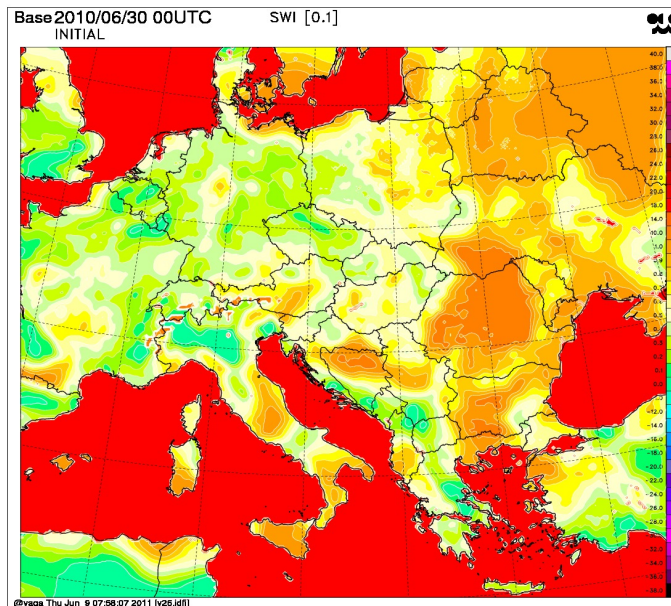




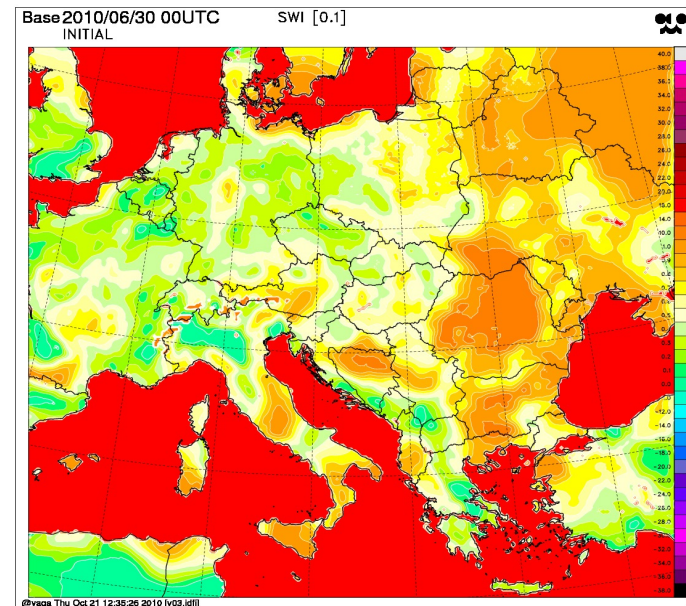
# Findings(5)

- 3DVAR alone dries a bit the soil

BlendCan analysis at last day



BlendVar analysis at last day

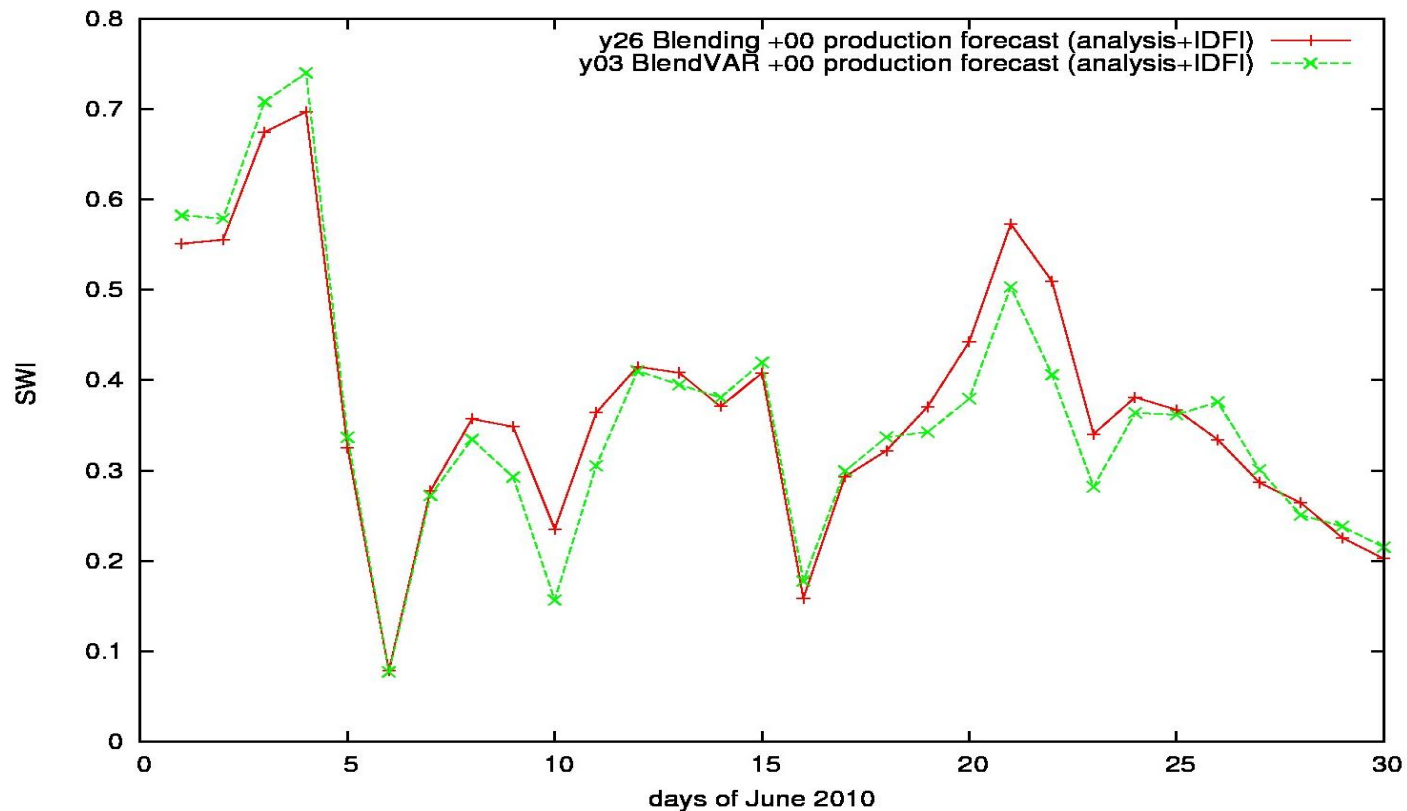


# Findings(5)

- 3DVAR alone dries a bit the soil

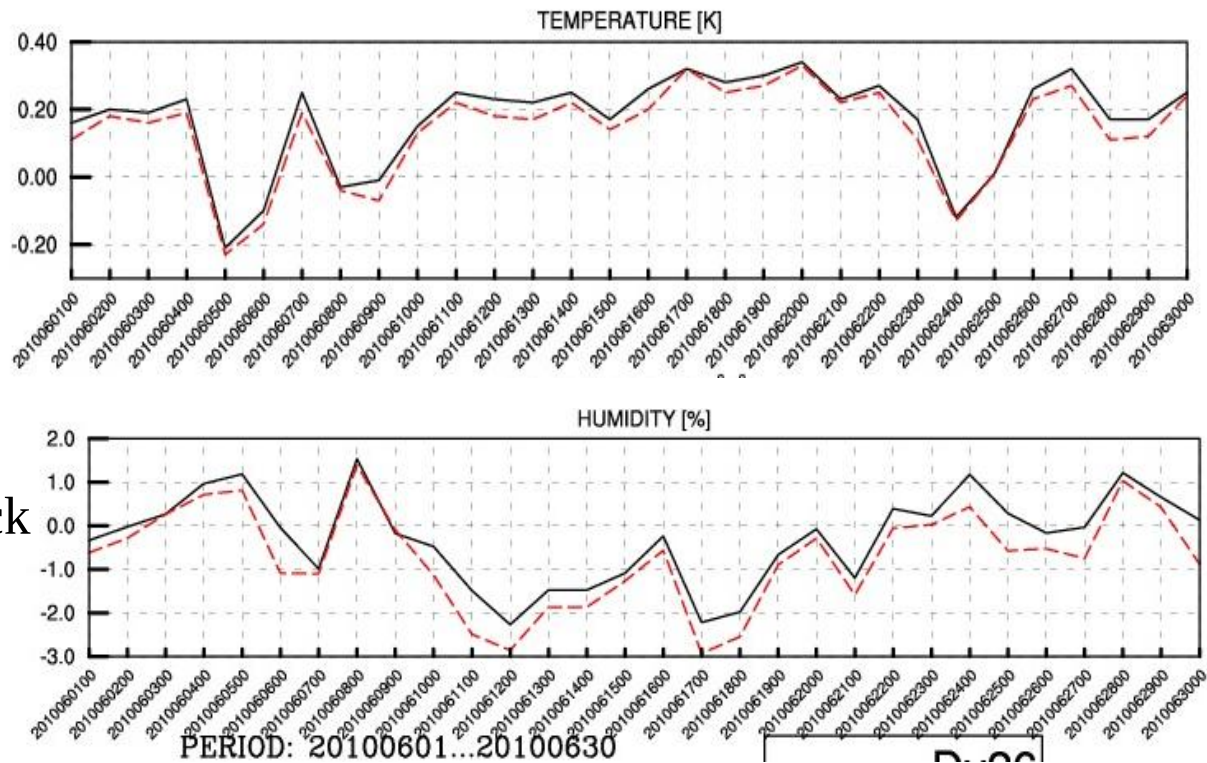
BlendCan: red

BlendVar: green



# Findings(6)

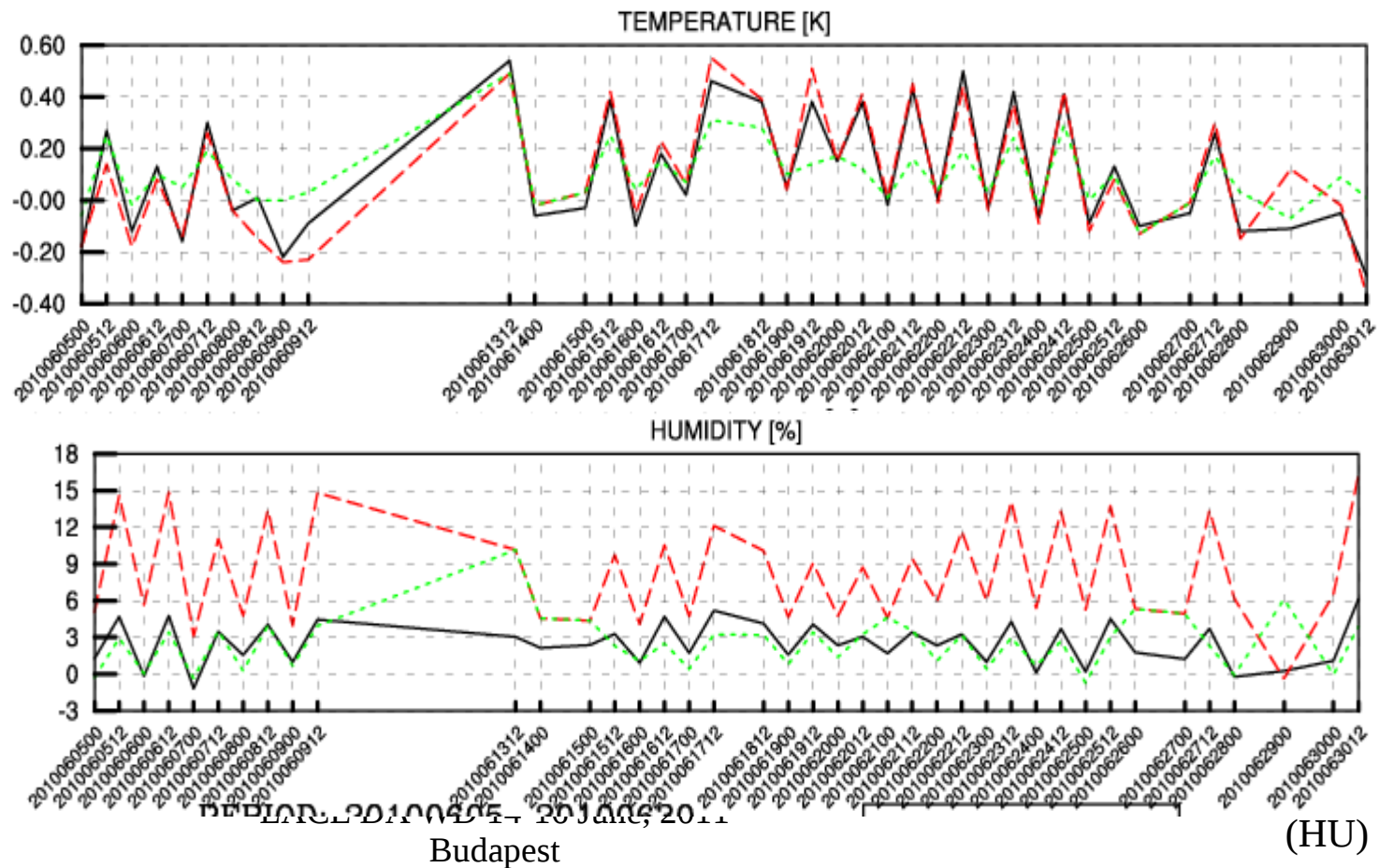
- 3DVAR alone „dries” and „cools” a bit the 2m



BlendCan: black  
BlendVar: red

# Findings(6)

- 3DVAR alone „dries” and „cools” a bit the 2m



# Some conclusions

- Assimilation changes the SWI significantly (compared to the global IC)
- Most of the SWI change comes from CANARI probably (CZ)
- The effect of the SWI change by assimilation makes mostly a positive impact on 2m RH and T
- It is worth to run CANARI to improve the 2m scores
- But we do not understand everything...

# Questions

- Does soil and 2m change in the opposite direction due to assimilation?
- Does CANARI and 3DVAR act in a different direction?

In the soil:

- Moistening by 3DVAR+CANARI
- Drying by 3DVAR alone

At 2m:

- Moistening and heating by 3DVAR+CANARI
- Drying and cooling by 3DVAR alone
- The effect of CANARI >3DVAR for the 2m?

- What can be the reason for these findings?