# Use of ALADIN for dynamical downscaling of precipitation

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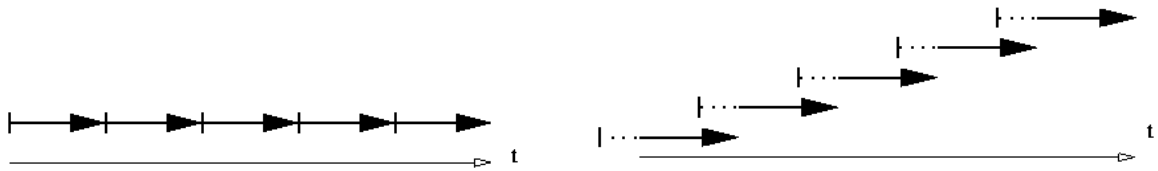
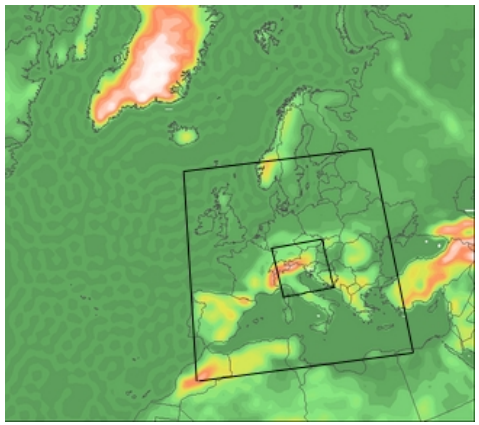
# Introduction (1)

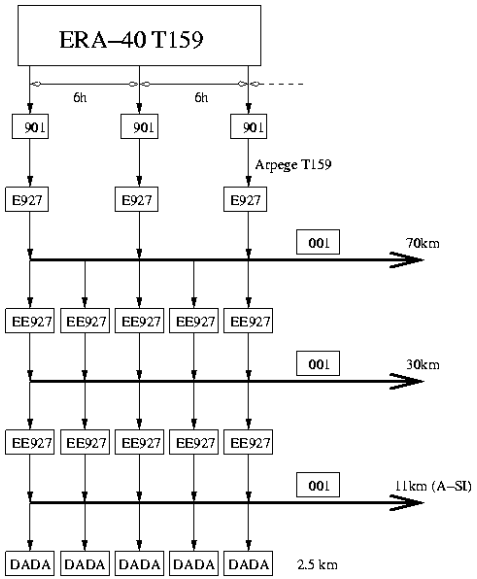
- Nesting ALADIN into ERA-40 T159/L60, with use of conf. 901 for conversion to Arpege FA
- Sequential runs over a period



# Introduction (2)

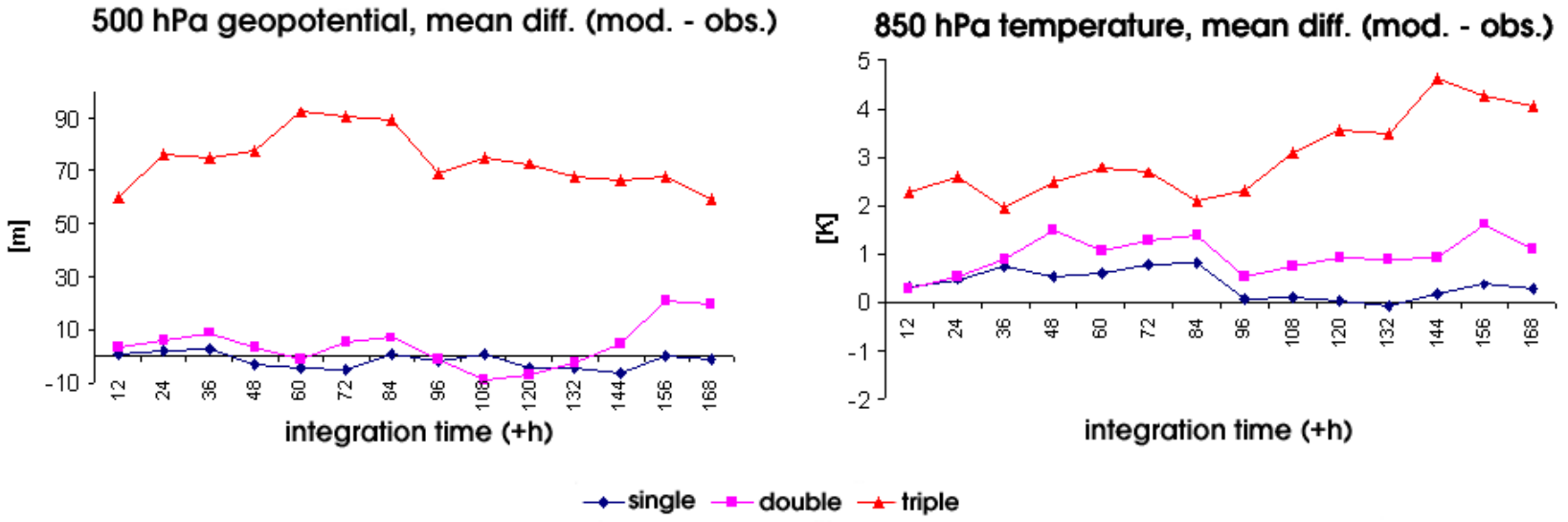
- Using different nesting schemes and integration lengths






- MAP SOP for evaluation

# Results over MAP-SOP

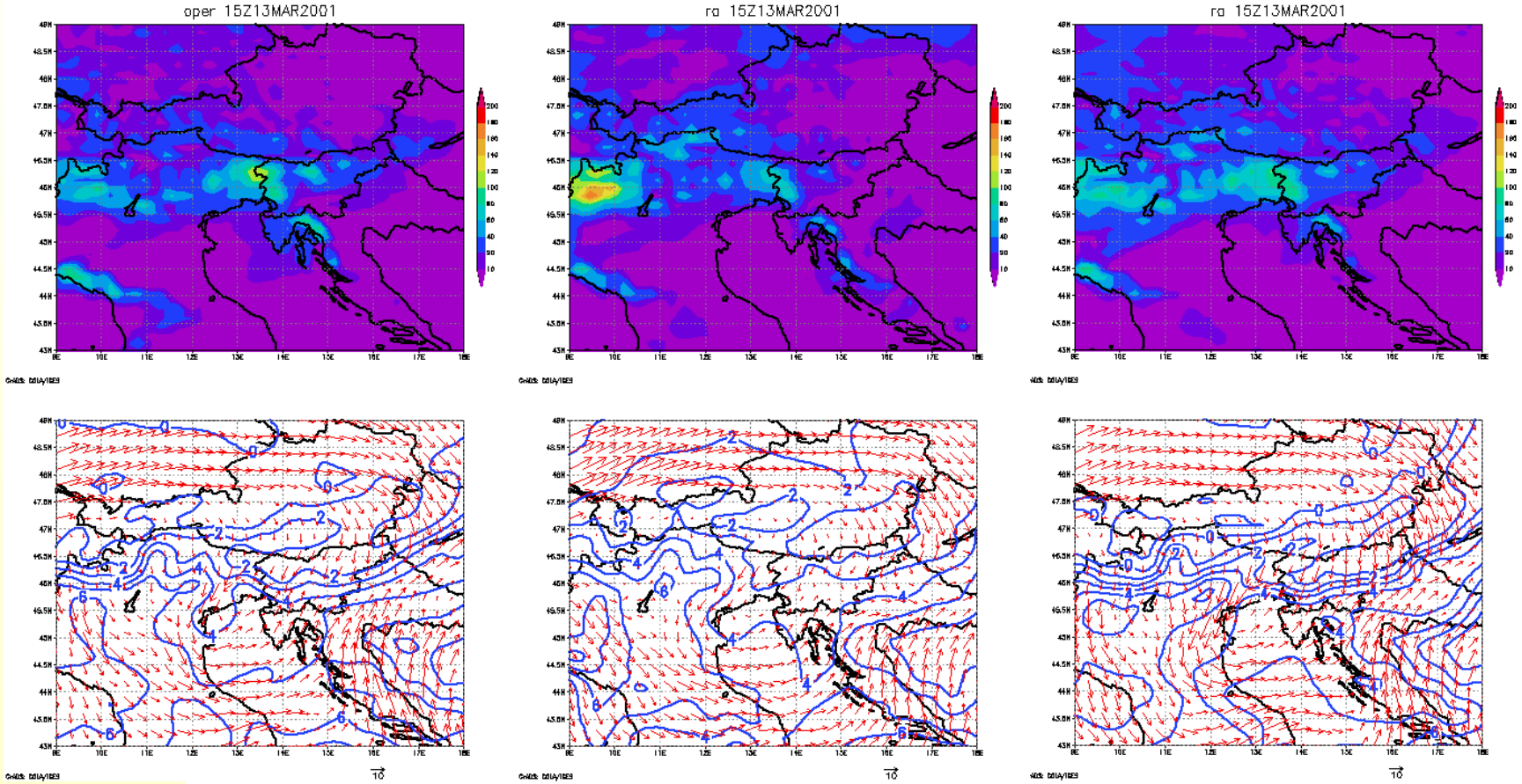


# Why nesting?

operational A-SI (double n.)

ERA-40 & ALADIN w. single n.

ERA-40 & ALADIN w. double n.

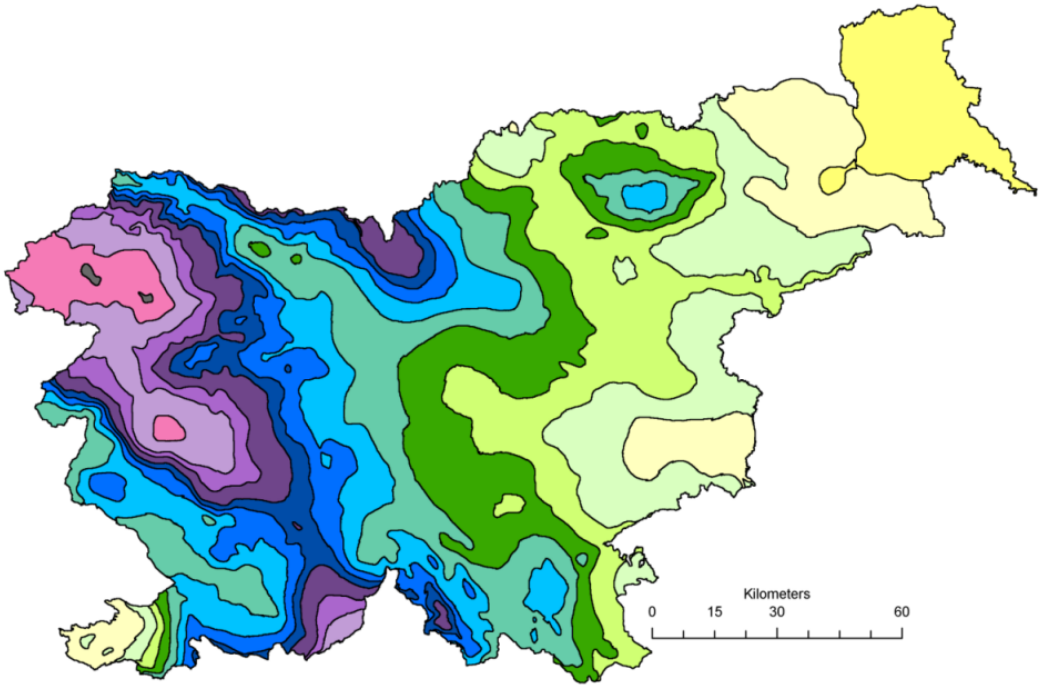


# Simulating Longer Periods

- Up to now: 5 years of double nesting 60hrs long integrations with 12 hour time-lag
- Main objective for doing this: mapping of wind potential (aid to climatological research)

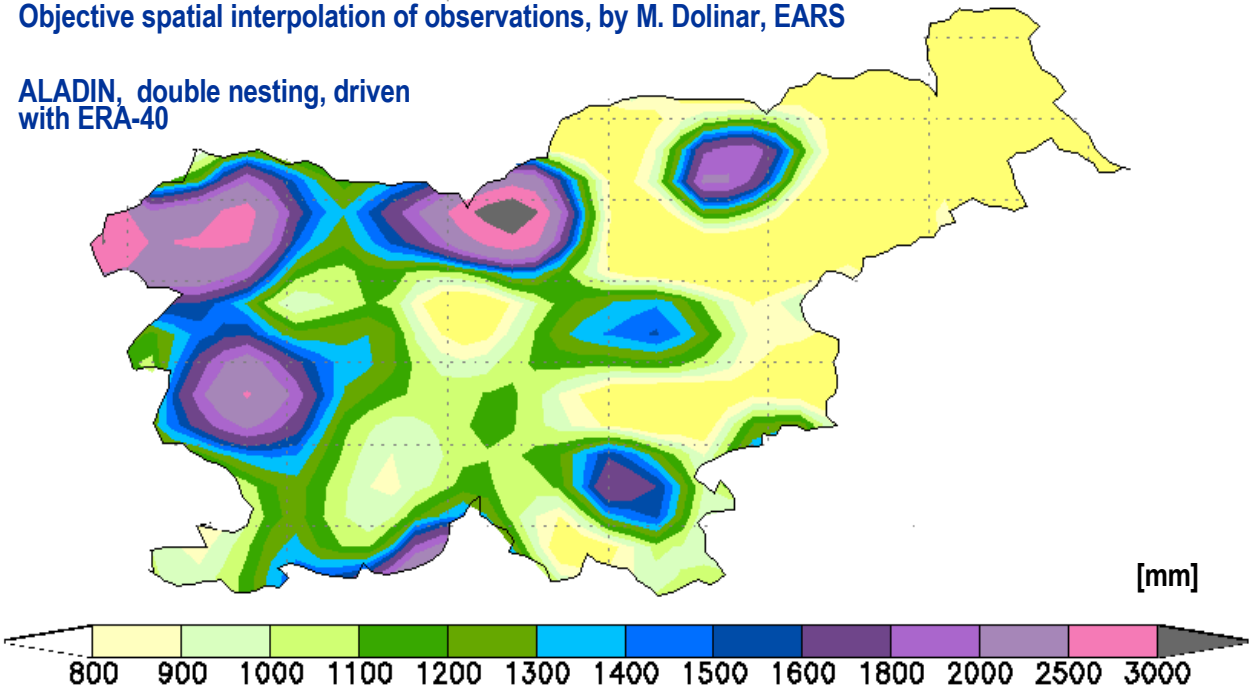
# Results:

## total precipitation in 1997



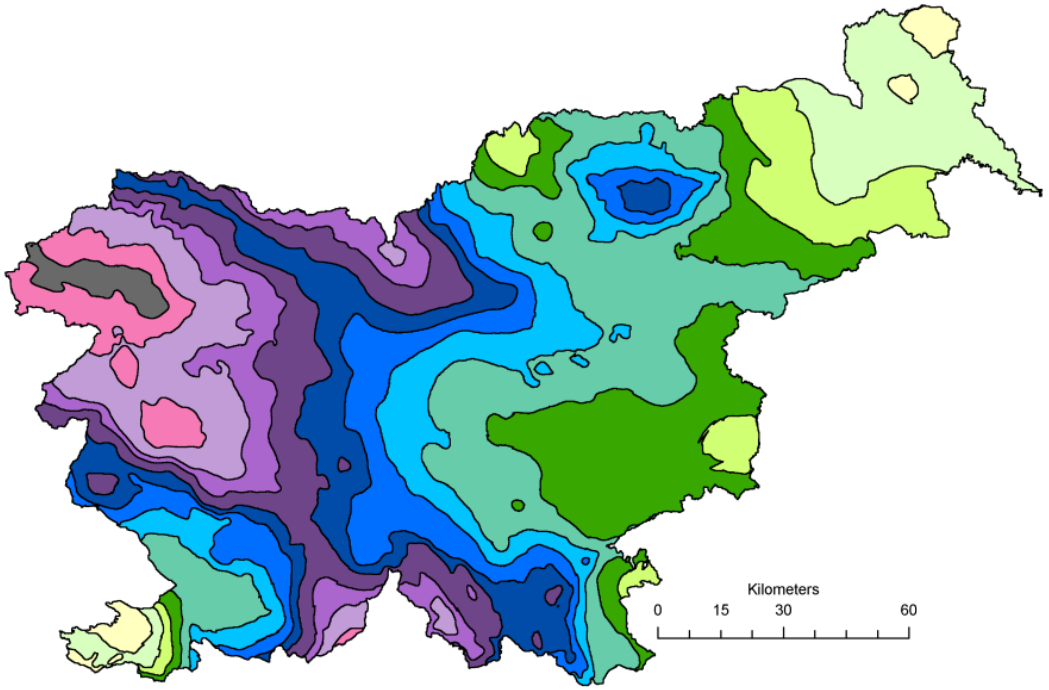

Objective spatial interpolation of observations, by M. Dolinar, EARS

ALADIN, double nesting, driven with ERA-40



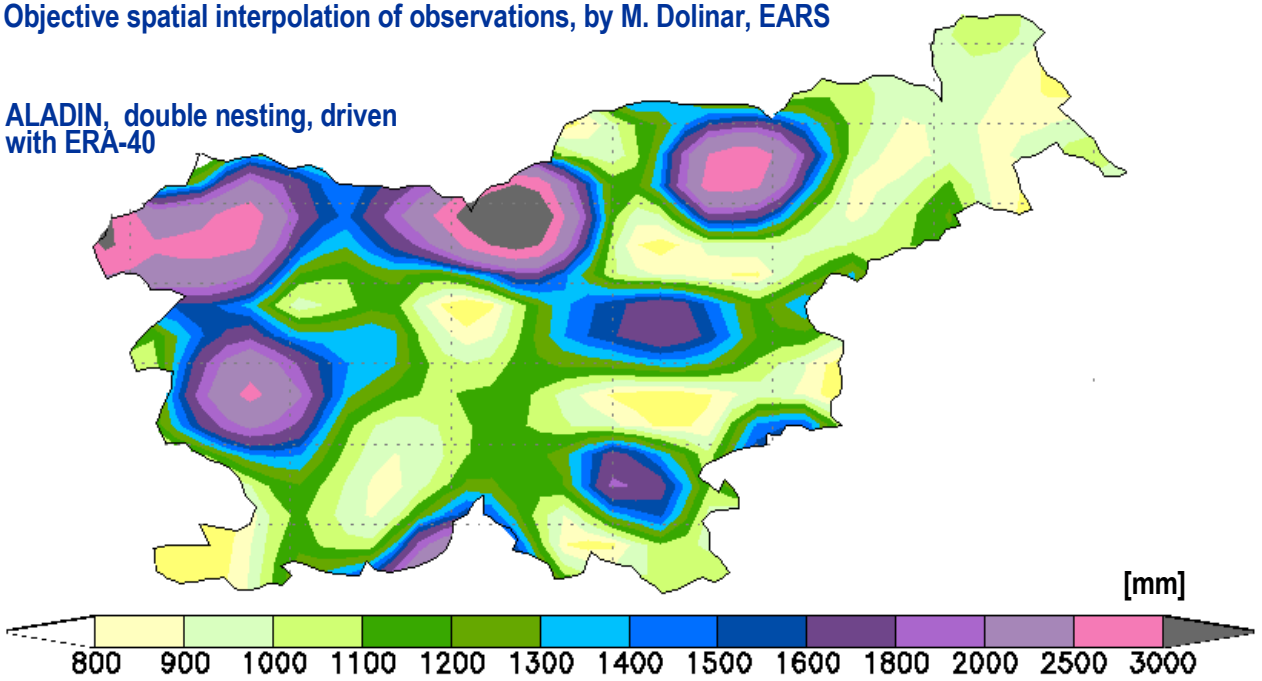
# Results:

## total precipitation in 1998



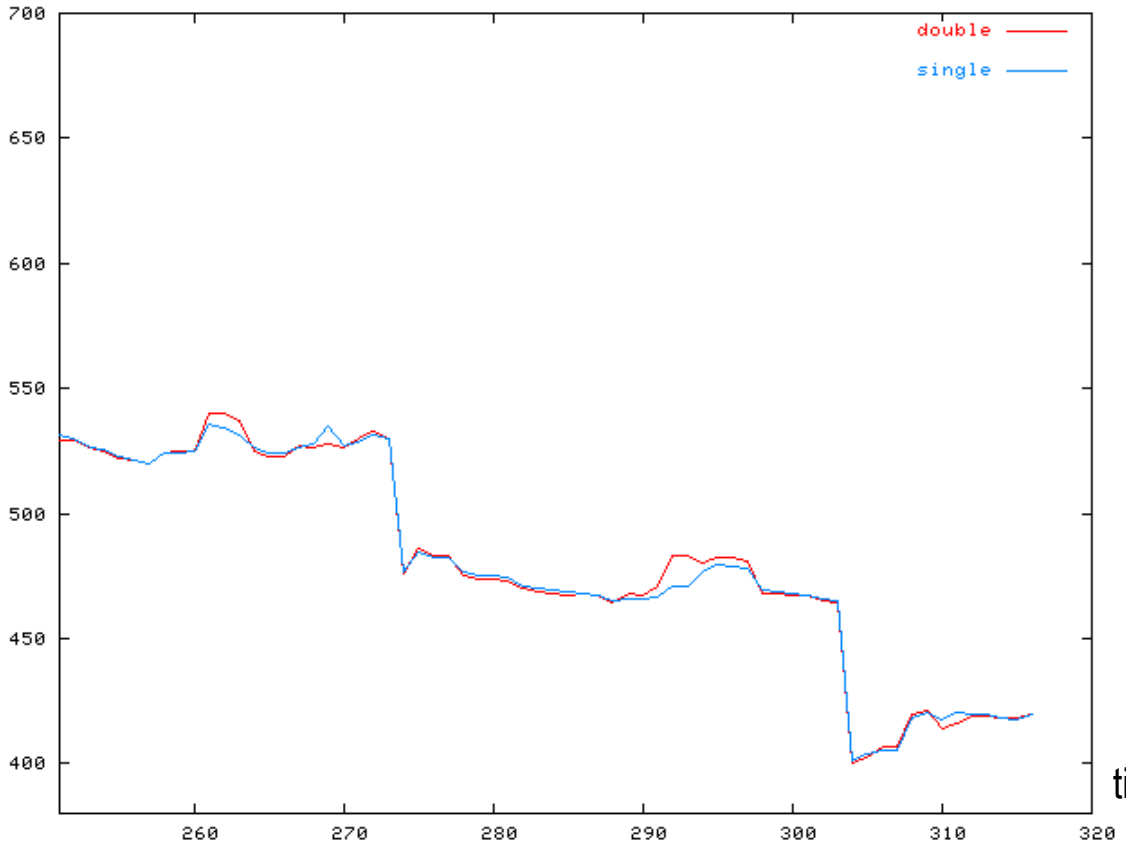

Objective spatial interpolation of observations, by M. Dolinar, EARS

ALADIN, double nesting, driven with ERA-40



# Problem – initialization of deep soil moisture

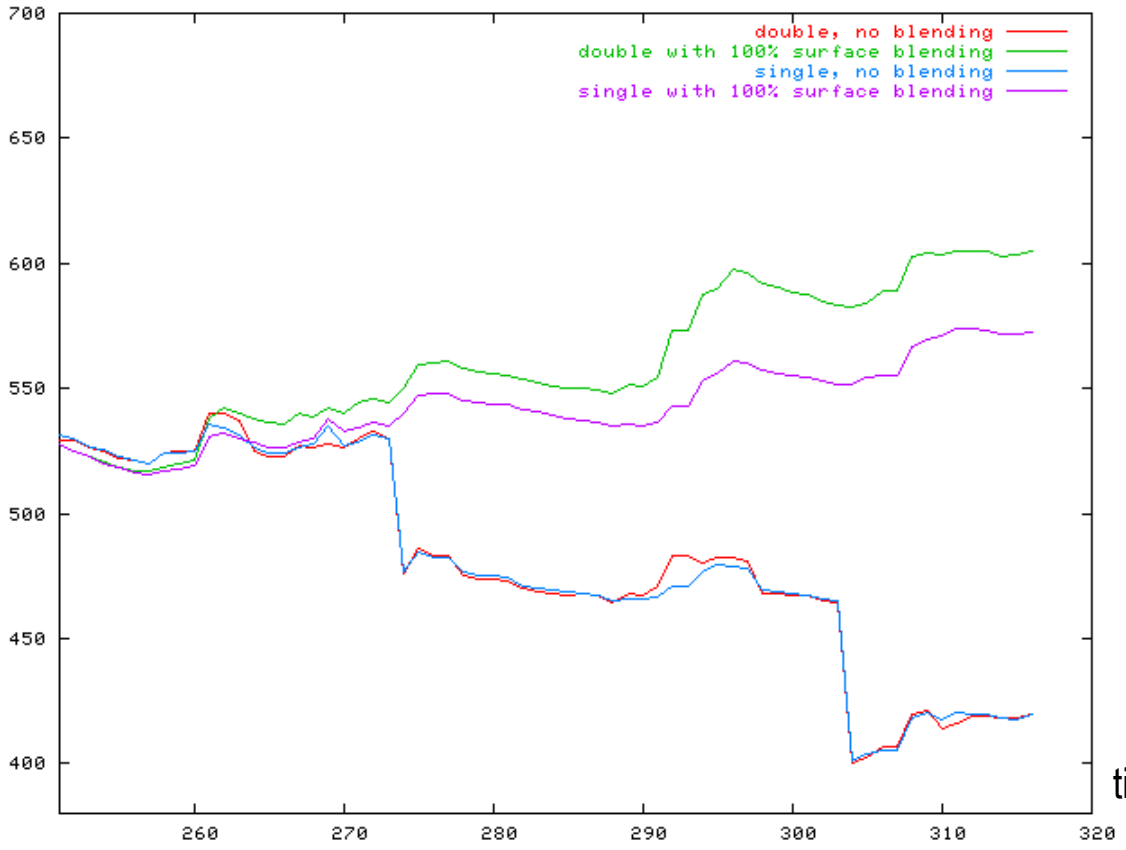
time evolution of deep soil moisture, averaged over domain




time (jul. days in 1999)

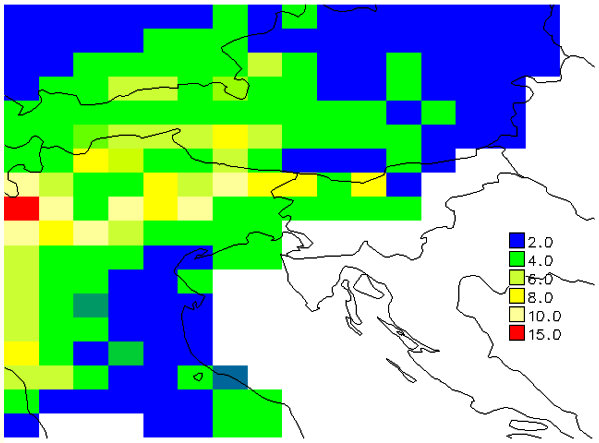
# Possible solution – blending of surface fields

time evolution of deep soil moisture, averaged over domain

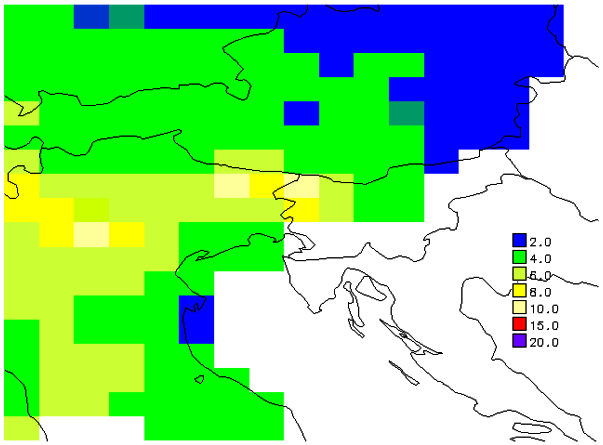


# Surface blending vs. no blending (1)

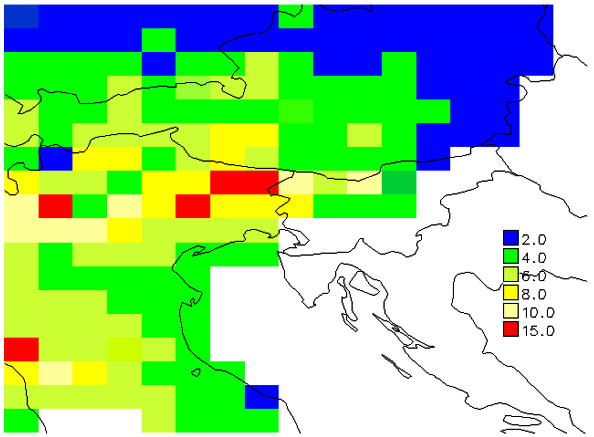
average daily precipitation over SOP [mm]



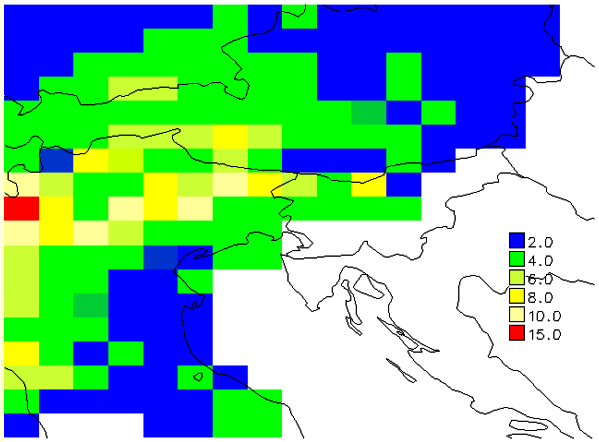

single nesting, no blending



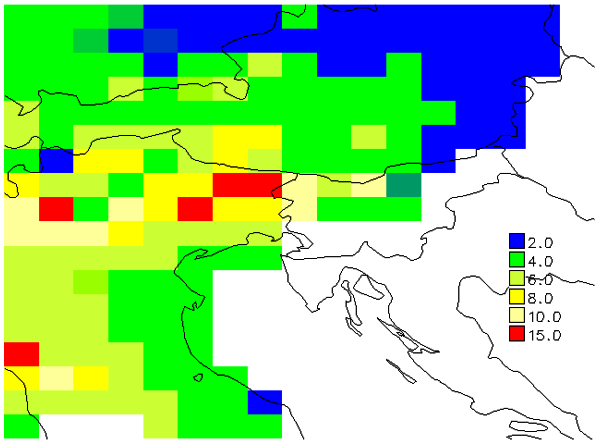

F&H analysis




double nesting, no blending




single nesting, surface blending



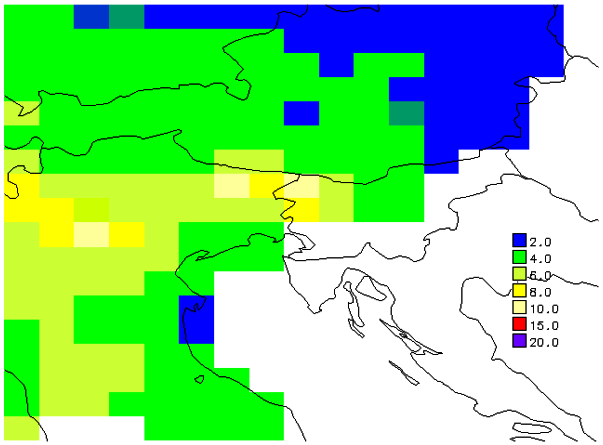

double nesting, surface blending

# Surface blending vs. no blending (2)

scores

Bias= -0.44
RMSE= 9.08

**single nesting, no blending**




**F&H analysis**

Bias= +0.46
RMSE= 9.78

**double nesting, no blending**

Bias= -0.46
RMSE= 9.44

**single nesting, surface blending**

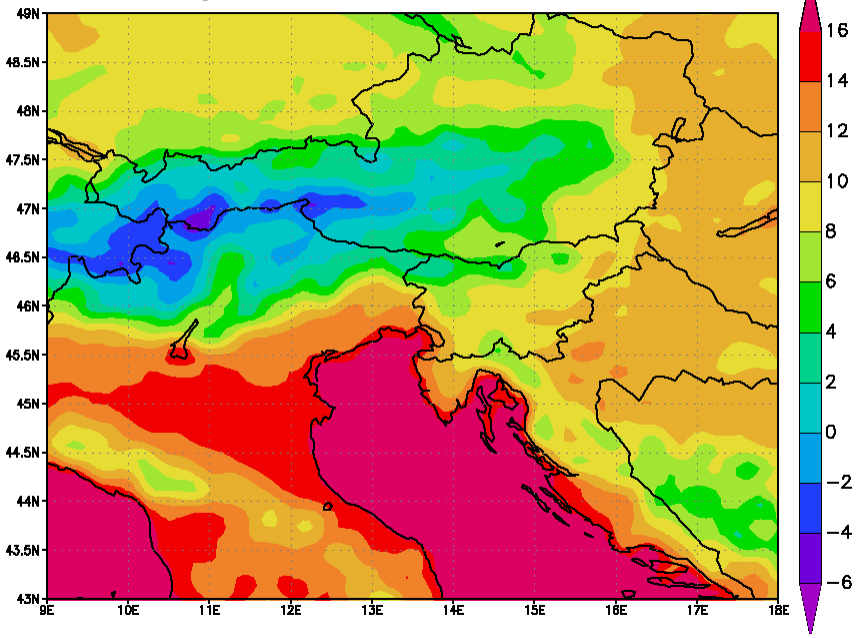
Bias= +0.53
RMSE= 8.66

**double nesting, surface blending**

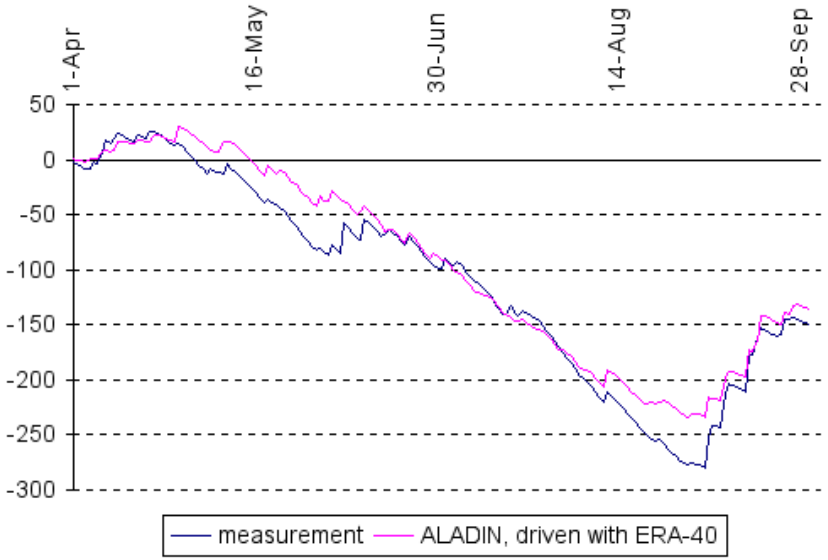
# Results – water balance

## 2m temperature and evapotranspiration

**Average 2m temperature [C], 1997-2001**




**Water balance in Murska Sobota, summer 2001 drought (precipitation + evapotranspiration) [mm]**




**Analysis by B. Kurnik, EARS**

# Conclusions

- Single nesting is not enough

  (at least for such a small domain)
- Surface blending does not have a significant impact on precipitation scores – whole year test?
- No initialization of ISBA fields can be dangerous –> relaxation towards ERA40
- Improvements with the use of local data (radar, ...)?