

The SWI diagnostic study for July 2010

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1 Motivation

Motivation for this study was bad verification scores for 2m parameters for production from assimilation cycle compared with operational production (dynamical adaptation). These problem were noticed for summer time. Common diagnostic studies were arranged during DA working days in Ljubljana, 2010. Plan was to plot SWI evolution for specified places for June 2010. and than to compare it with results from other meteorological centers.

2 Results

Figure 1. shows evolution of SWI for 5 specified places. Three experiments are shown:

- *background* - 6h forecast from assimilation cycle
- *analysis* - analysis from assimilation cycle using *background*; Canari → 3Dvar → DFI
- *oper* - operational setup (dynamical adaptation of Arpege fields)

Evolution of SWI of *background* and *analysis* is rather similar for most of the selected places. Compared to *oper* there are periods when SWI of *analysis* is bigger but also periods where SWI of *analysis* is smaller. At the beginning of the month SWI of *analysis* is bigger for Zagreb and Ljubljana, smaller for Prague and Vienna and rather similar for Budapest. At the end of the month SWI of *analysis* is mainly smaller for most of selected places.

Looking at the evolution of *analysis* SWI one can notice that there is sharp reduction of SWI for all selected places after first 4-5 days of June. Second maximum can be noticed in mid-June (Vienna) or at the end of June (Zagreb). If evolution of SWI is compared to results obtained by others (HU, CH) than it can be seen that evolution of SWI at CRO shows similar behavior.

On Figure 2. the 2m temperature and humidity bias of individual runs in June 2010 for 00 forecast and for *analysis* and *oper* are shown. Also evolution of scores with forecast range for same parameters is shown.

Figure 3. shows mean monthly difference between SWI of *oper* and *analysis*. It can be seen that SWI of *analysis* is bigger except in Alpine region where it is smaller.

3 Preliminary conclusions

- evolution of SWI in CRO assimilation cycle behaves similar compared with HU and CH
- evolution of T2m scores with forecast range shows that bias of *analysis* is smaller during day and bigger during night compared to *oper*
- evolution of RH2m scores with forecast range shows that bias of *analysis* is smaller almost whole the time
- evolution of bias of individual runs shows that for RH2m *analysis* is mainly closer to observations than *oper*; for T2m is rather opposite
- SWI of *analysis* compared to *oper* is on (time) average bigger over domain => CANARI+3DVar moistens soil
- noticeable diurnal changes in SWI for both *background* and *analysis*; caused by model bias of T2m and RH2m

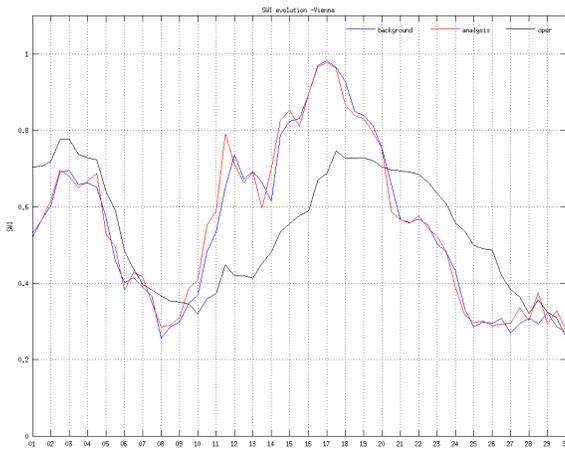
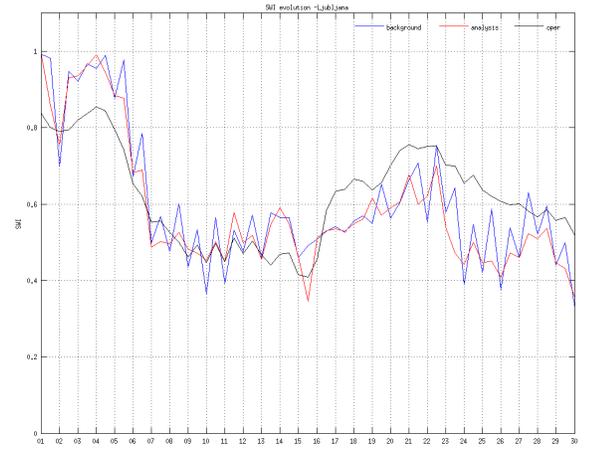
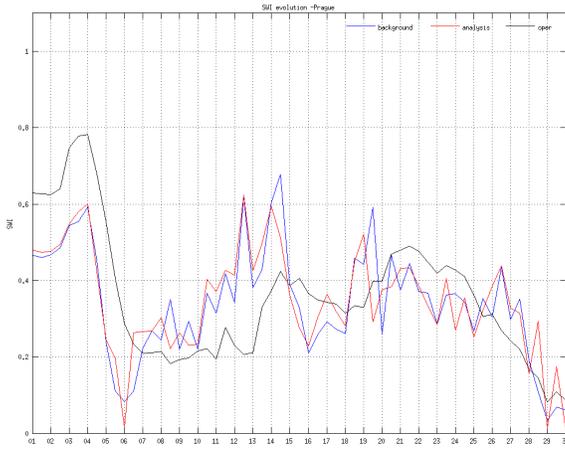
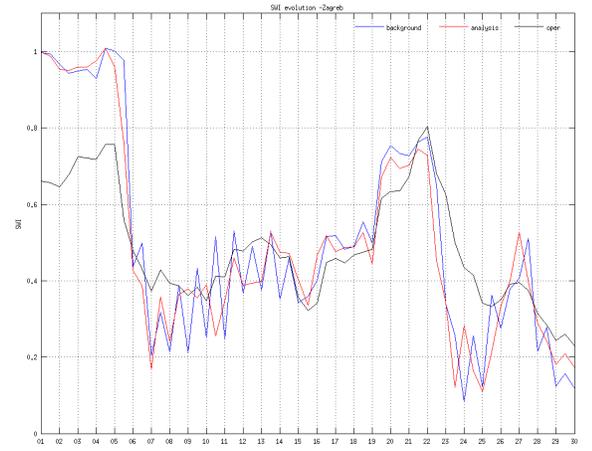
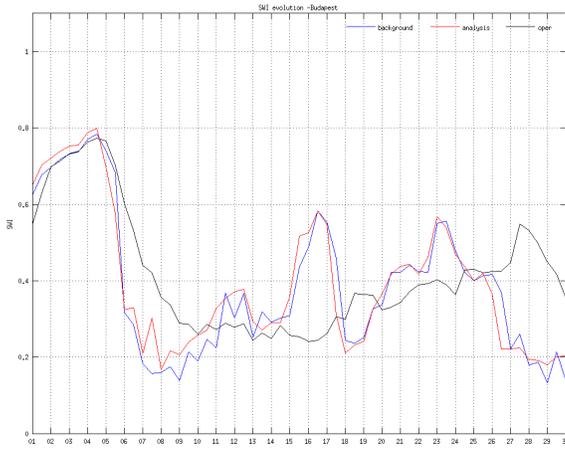


Figure 1: SWI evolution for June 2010 for Budapest, Zagreb, Prague, Ljubljana and Vienna every 12h. Blue color is *background* (6h forecast from assimilation cycle), red color is *analysis* and black color is *operational* setup (dynamical adaptation).

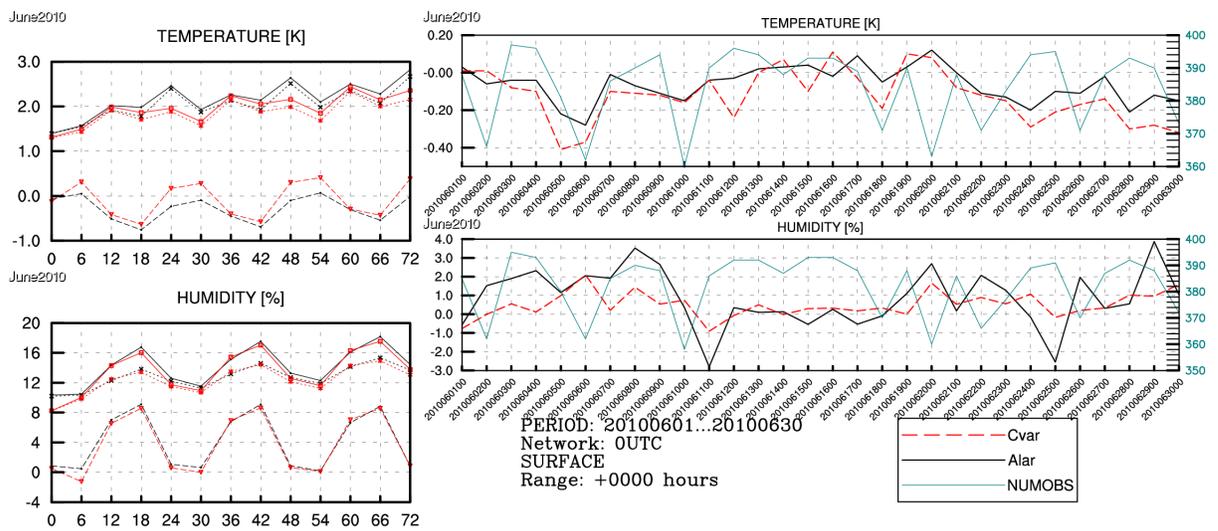


Figure 2: Left: Evolution of VERAL scores with forecast range of the 2m temperature and humidity for analysis (red) and oper (black). Right: Bias of individual runs for same parameters in June 2010 for 00 forecast.

SWI MEAN DIFF: OPER-ANALYSIS (01.06.2010.-30.06.2010.)

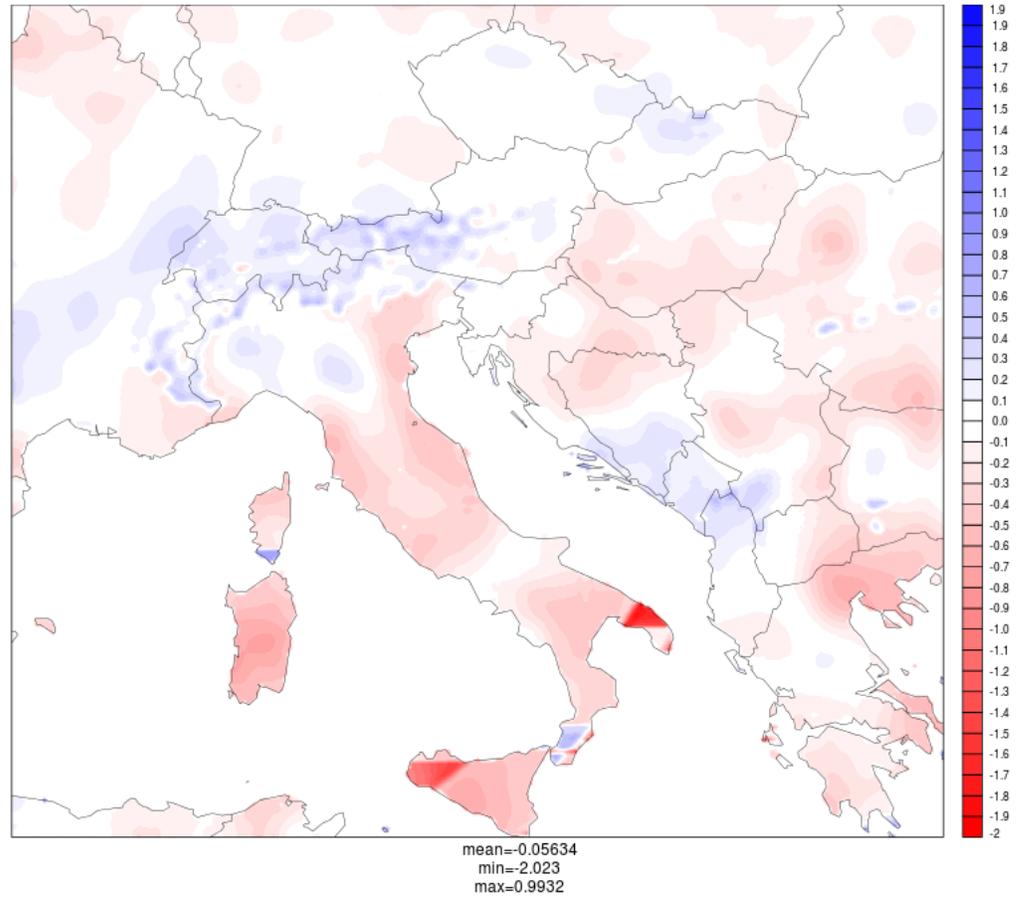


Figure 3: Mean SWI difference between oper and analysis