Tests of CANARI/Surface in ALADIN/CE

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Outline of the talk

• Setting of ALADIN/CE

• Implementation of CANARI surface analysis

• Impact studies
  - Test ADX
  - Test AEV
  - Test AEU

• Conclusion
Setting of ALADIN/CE

- ARPEGE/ALADIN cycle 29T2
- LACE domain (309x277 grid points, linear truncation E159x143, $\Delta x=9$km)
- 43 vertical levels, mean orography
- time step 360 s
- digital filter spectral blending, long cut-off 6h cycle (filtering at truncation E47x42, no DFI in the next +6h guess integration)
- digital filter spectral blending + incremental DFI initialization of short cut-off production analysis
- 3h coupling interval
- OpenMP parallel execution
- 00 and 12 UTC forecast to +54h
- 06 and 18 UTC forecast to +24h
Implementation of CANARI surface analysis

- OI method on ALADIN guess before upper-air spectral blending
- Surface analysis of T2m and RH2m, from which the increments of soil variables are computed
- We use spatial quality control of the observations
- We don’t analyze SST, this one is taken from ARPEGE.
- Any other land soil variables which are not analyzed (like snow) are initialized from the ALADIN guess with the relaxation to the climatology as implemented within the CANARI configuration
Test ADX from June till November 2005

T2m and RH2m RMSE (thick) and BIAS (thin) for June 2005 ADX (red) and reference (black)

T2m and RH2m RMSE (thick) and BIAS (thin) for August 2005 ADX (red) and reference (black)
Test AEV from March till August 2006

- ISBA polynomials version 02
- SMU0=0

T2m and RH2m RMSE (thick) and BIAS (thin) for March-April 2006 AEV (red) and reference (black)
Test AEV from March till August 2006

RMSE temperature

![Graphs showing RMSE temperature at different pressure levels: 250 mb, 500 mb, 700 mb, 850 mb.](image)
Test AEV from March till August 2006

BIAS temperature

- 250 mb
- 500 mb
- 700 mb
- 850 mb
Test AEV from March till August 2006

RMSE relative humidity

250 mb

500 mb

700 mb

850 mb
Test AEV from March till August 2006

BIAS relative humidity

![Graphs showing BIAS relative humidity at different pressure levels (250 mb, 500 mb, 700 mb, 850 mb).]
Impact of CANARI surface analysis

Increments of the deep water reservoir field for March 9th 2006

spectral blending

CANARI surface analysis
Impact of CANARI surface analysis

Content of the ice deep reservoir field for April 1st 2006

an interpolated ARPEGE CANARI surface analysis
Test AEU March 2006

- Incremental mode (LAEINC) updating of guess upper-air fields by their analysis (from spectral blending) inside CANARI
- Source code modifications needed to run it for ALADIN
- Scores worse than AEV

T2m and RH2m RMSE (thick) and BIAS (thin) for March 2006 AEU (red) and reference (black)
Conclusion

- Performed tests showed significant impact of the surface analysis
- CANARI surface analysis (version AEV) was switched to operational August 3rd 2006
Thank you for your attention.