



SMHI HARMONIE Reanalysis: overview

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SMHI reanalyses in UERRA

SMHI
HARMONIE - ALADIN

1961

2006 2010

> 2015

SMHI
HARMONIE-ALARO

2004

2009

SMHI
MESAN
Cloud Analysis

1993

2015

Météo-France
MESCAN Surface Analysis

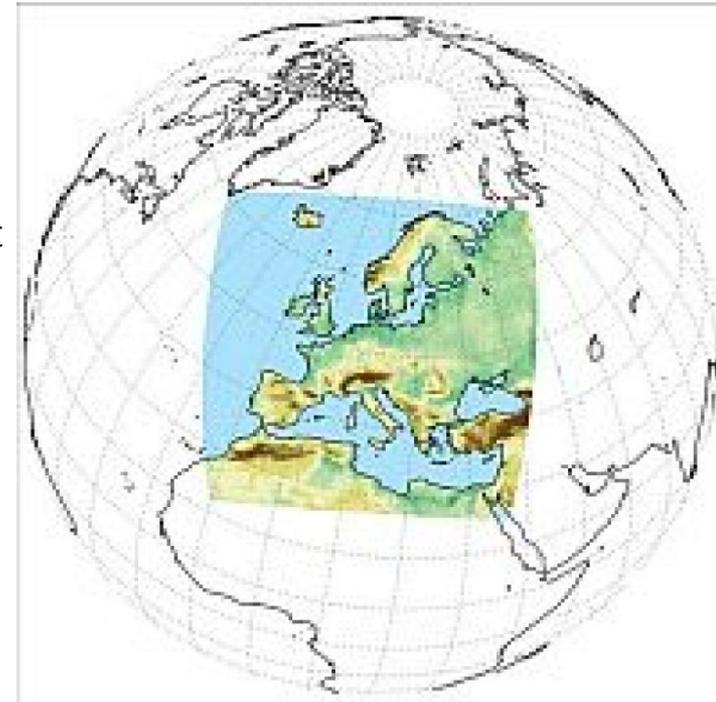
HARMONIE (HIRLAM ALADIN Regional/Mesoscale Operational NWP In Europe)

- HARMONIE
 - Cy38h1.1
 - 11 km horizontal resolution, 65 vertical levels
 - Semi implicit, semi Lagrangean, hydrostatic dynamics
 - ALADIN physics
 - SURFEX

- Data assimilation
 - 3DVar for upper air – Conventional observations (SYNOP, Ship, Buoys, Radiosondes, Pilot and Aircraft)
 - Large scale constraint – Jk
 - OI for the surface – T2m, RH2m and snow water equivalent

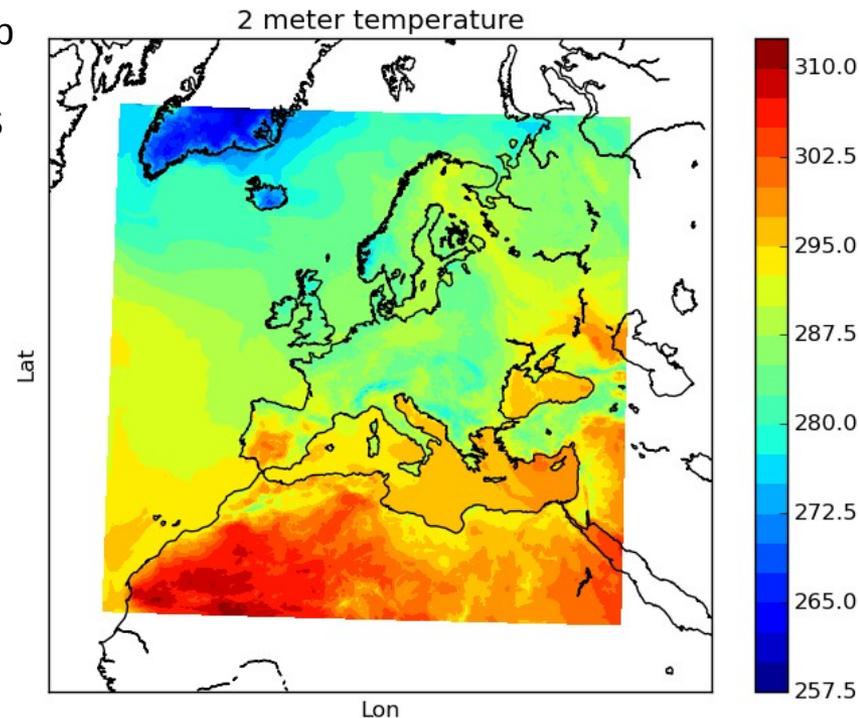
- Observations and Boundaries
 - 1961-2001 we used ERA40 observations with addition of Swedish and French observations in the early years. After that operational data
 - 1961-1979 we used ERA40 boundaries. After that ERAinterim

*EURO-CORDEX domain 4
576x576 grid points*



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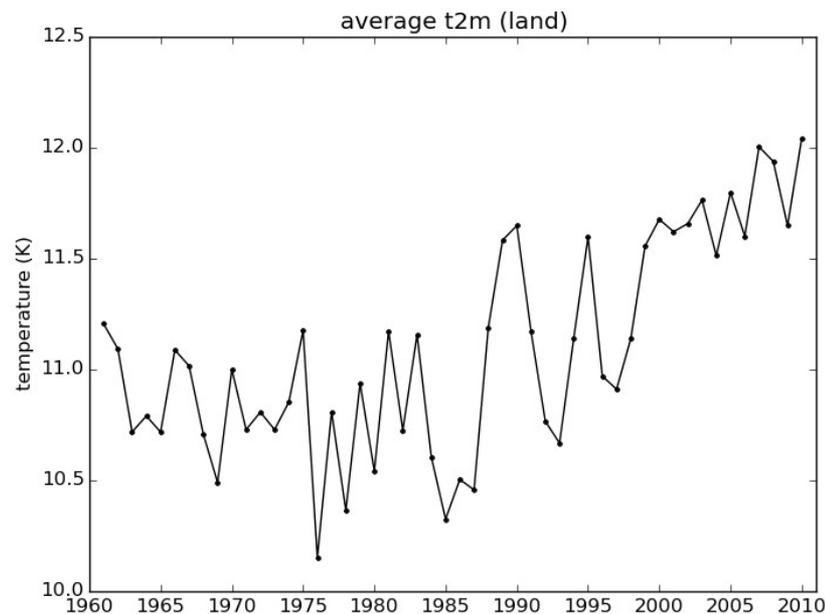
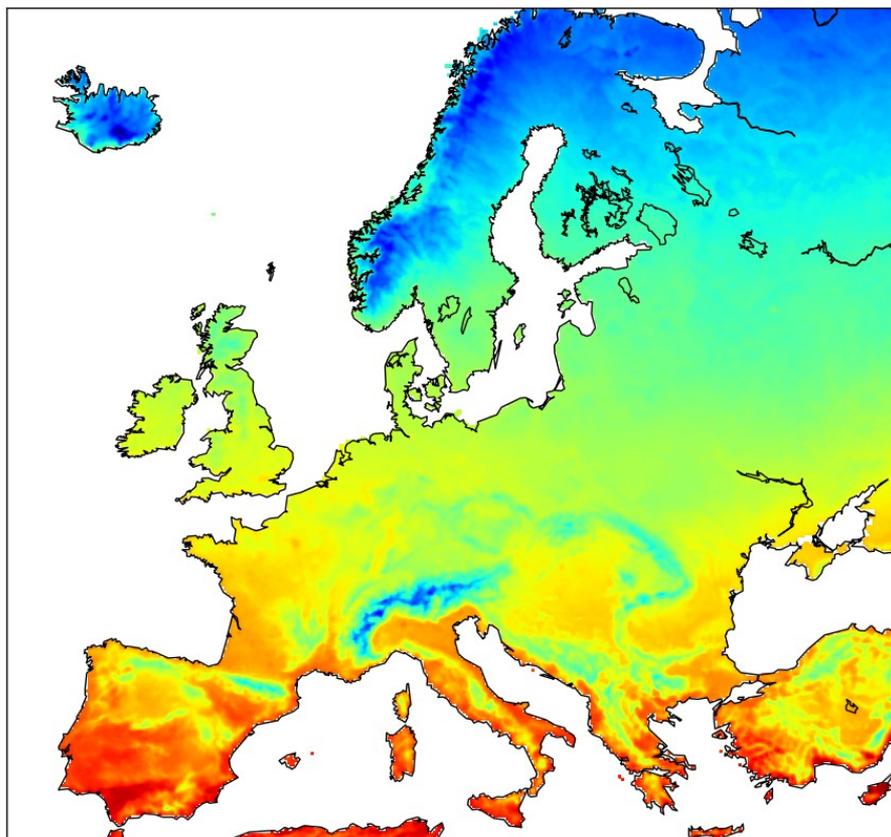
- Forecasts
 - 30 hour forecasts at 00 and 12
 - 1 hour resolution up to 6 hours, 3 hour resolution up to 30 hours
- Run at ECMWF
 - Several streams (5-10 years) with 4 months overlap
 - ~180 milj. SBUs
 - ~1200 Tb data of which ~350 Tb is stored in MARS
- 5 years with HARMONIE-ALARO
 - 2006-2010
 - Preparation for the longer re-analysis
 - Mini ensemble for uncertainty estimates



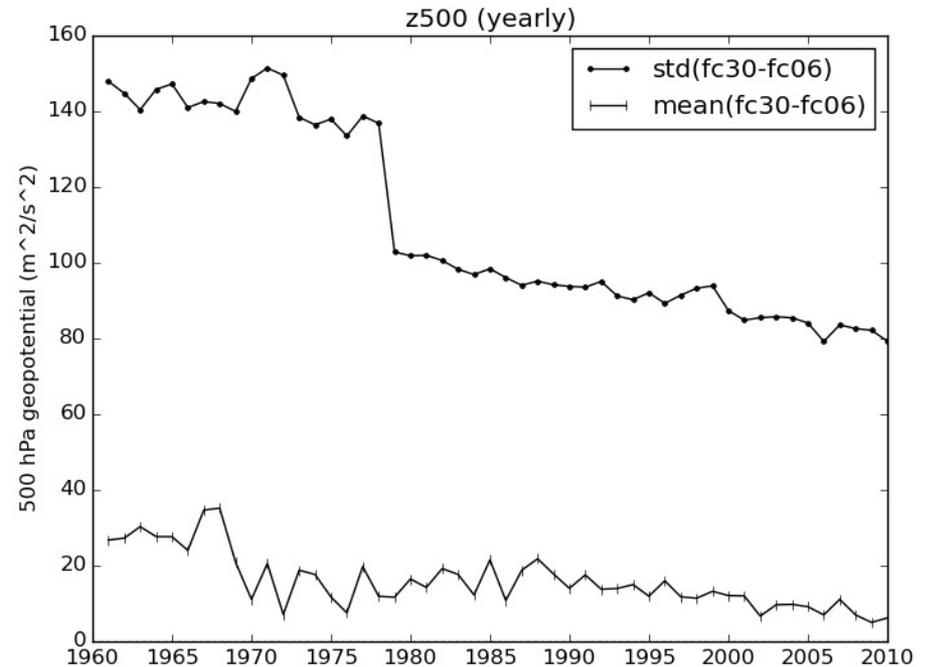
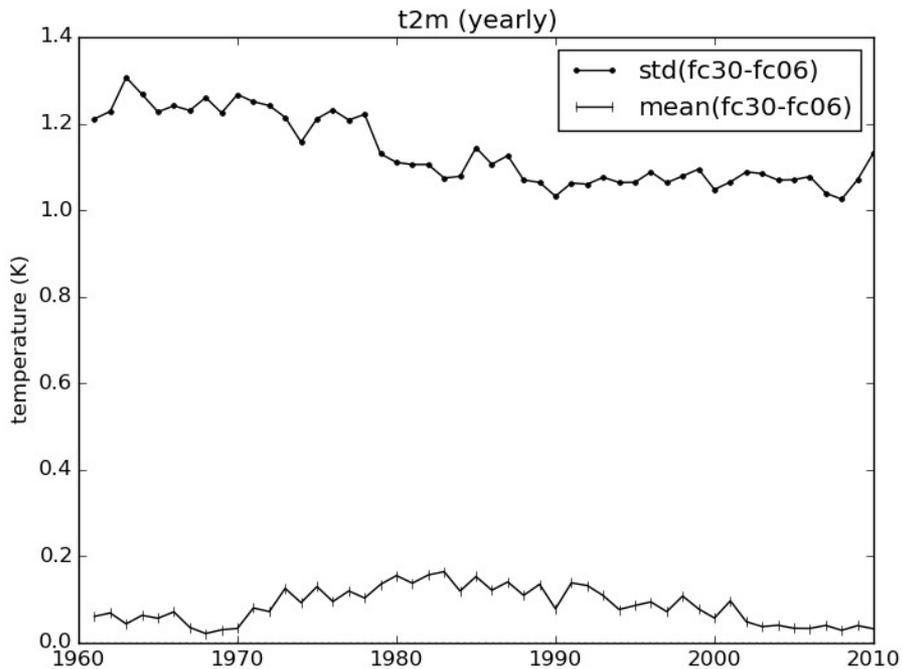
All observations 1961-2015



T2m analyses climatology, land points



Comparing 6- and 30-hour forecasts, consistent comparison
 Considering the 6-hour forecast to be the “truth”



MESAN cloud re-analysis

- Cloud fraction re-analysis
 - Geostationary satellites
 - Polar orbiters
 - EURO4M HIRLAM re-analysis for first guess and gap filling

- 2004-2009 delivered
 - Good quality data from CLAAS-A1 (SEVIRI) and CLARA-A1 (AVHRR)
 - Report written: D2.10 MESAN Cloud Analysis

- 1993-2015 in production
 - New, good quality data is now available from CLARA-A2
 - The method needs some adaption to the new data
 - Possibly also UERRA re-analyses for first guess and gap filling
 - Due to man power problems it has been delayed
 - The goal is to finish before the end of the project

Summary

- A long deterministic re-analysis has been produced and archived
 - The production in general seems to be ok
 - Most parameters are ok with good results
 - Some problems discovered that can be fixed
 - Some problems discovered that cannot be fixed

- A cloud fraction re-analysis has been produced
 - First version is very short
 - Second version will be much longer