Harmonie RA Results

Presented at the UERRA-GA in Reading 21-23 nov 2016
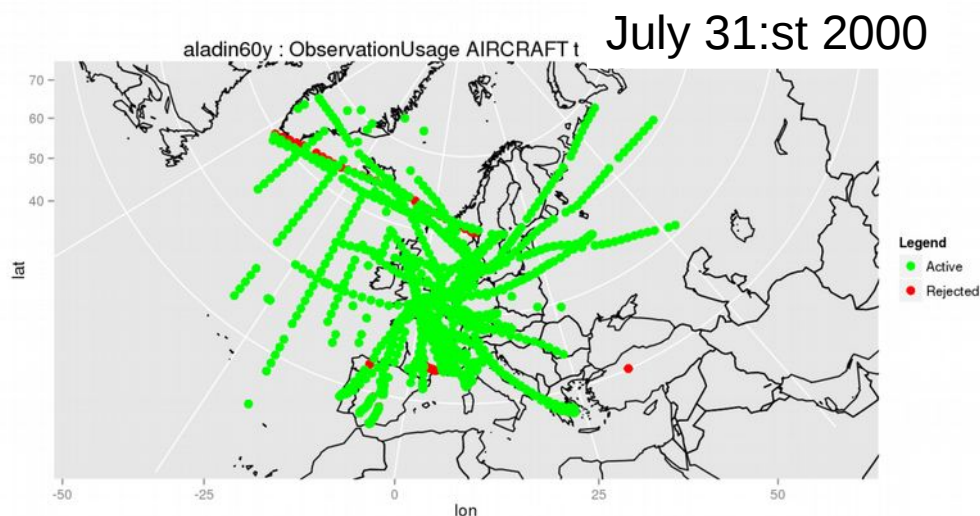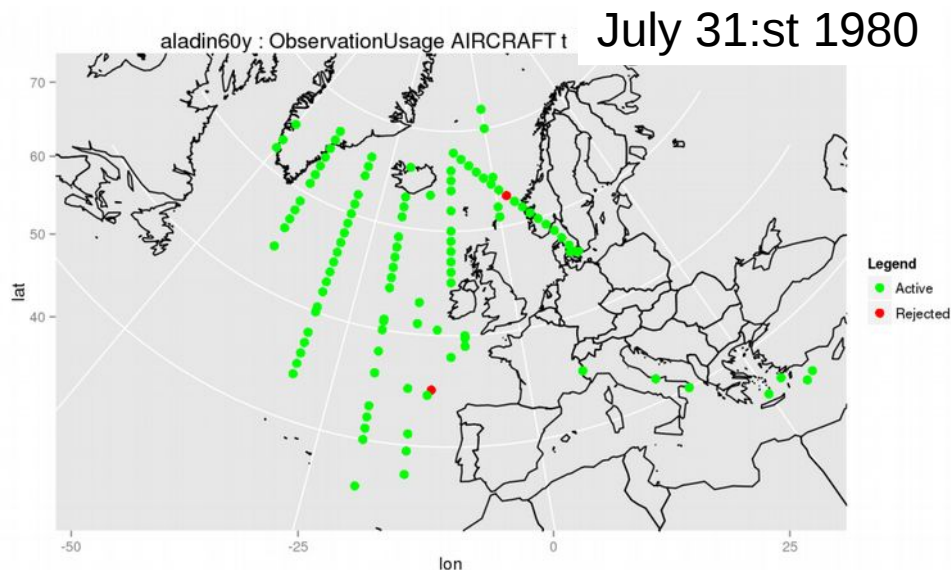
Esbjörn Olsson
Per Undén, Martin Ridal, Heiner Körnich, Ulf Andrae, Jelena Bojarova, Patrick Samuelsson and Tomas Landelius
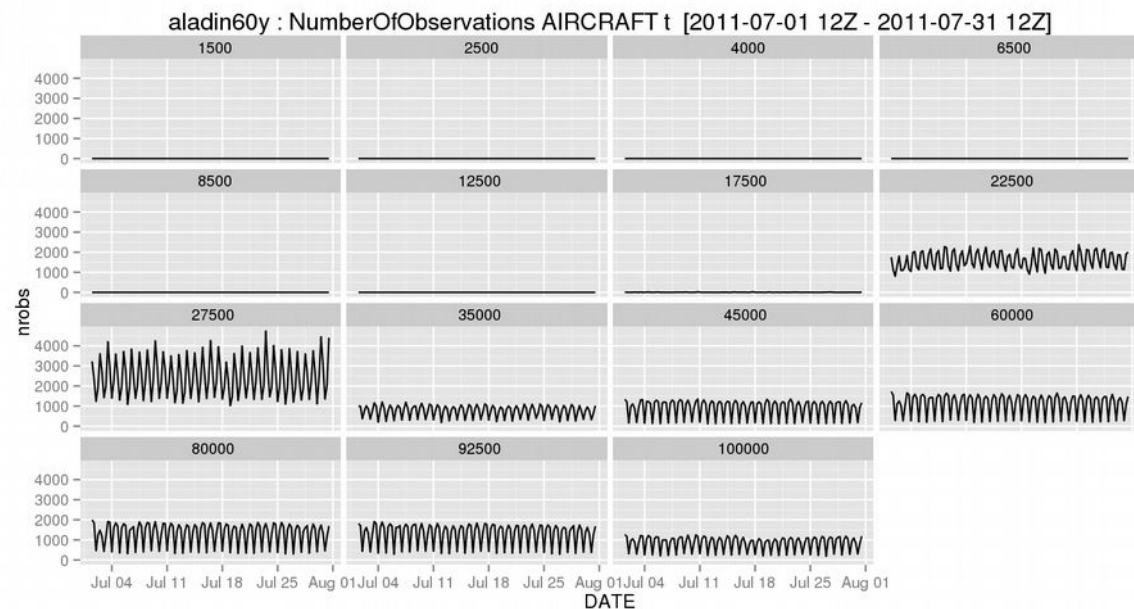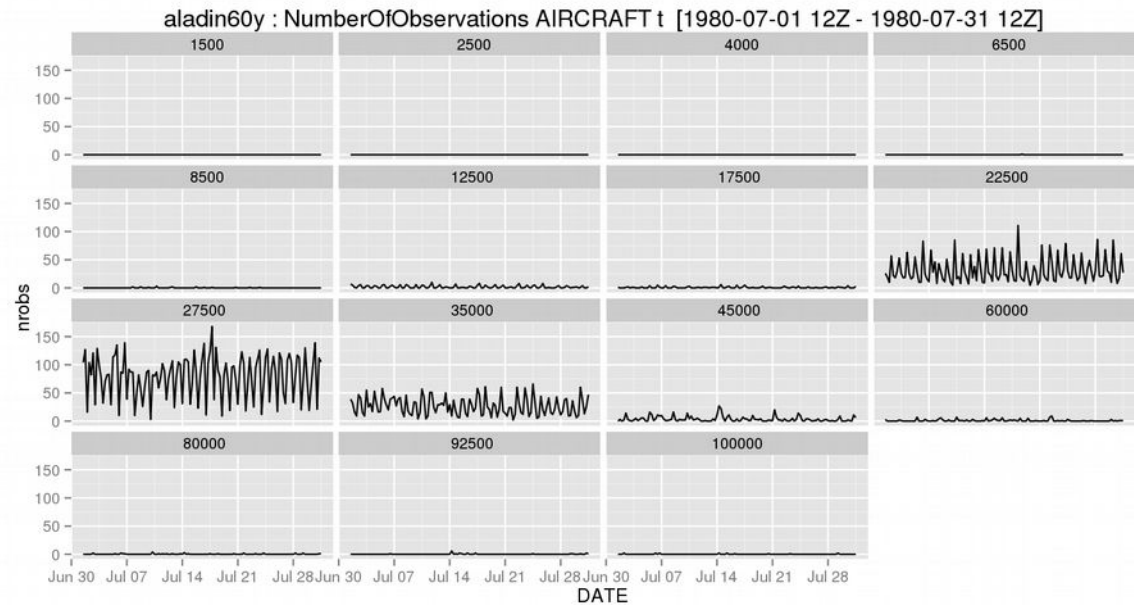
Contents:

- Observation usage (conventional)

- Verification

- Archiving

- Availability of observations has changed a lot from 1960 until today.

- Changes in density and spatial distribution.

- Most dramatic change in aircraft observations.

- Increase also for SYNOP.

- Number of soundings increased during 1970-1990, after that a slight decrease.
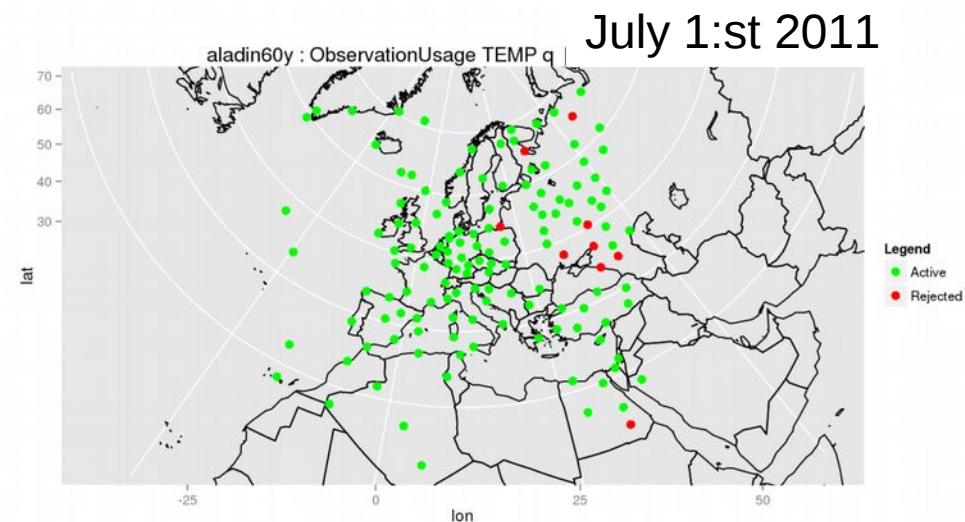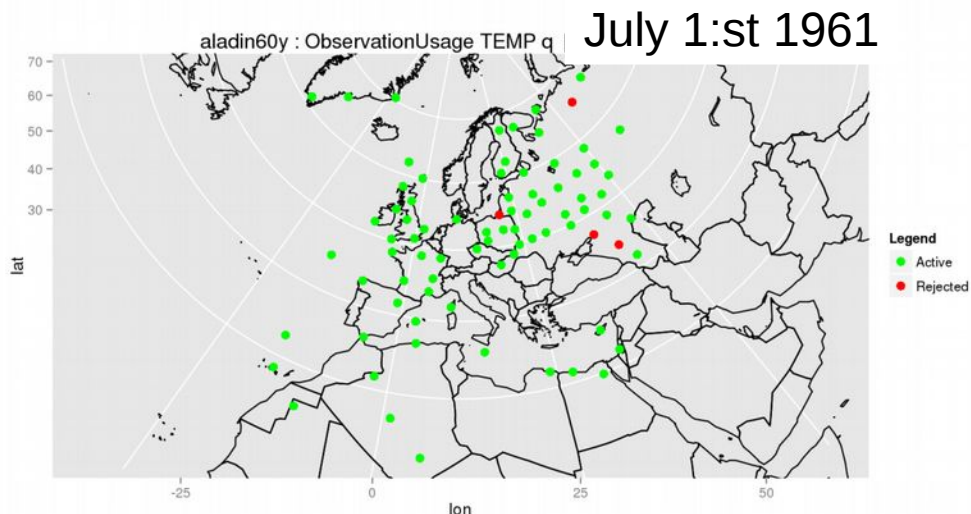
July 31:st 1980

- None for the first 20 years.

- Manual in the beginning (airep)

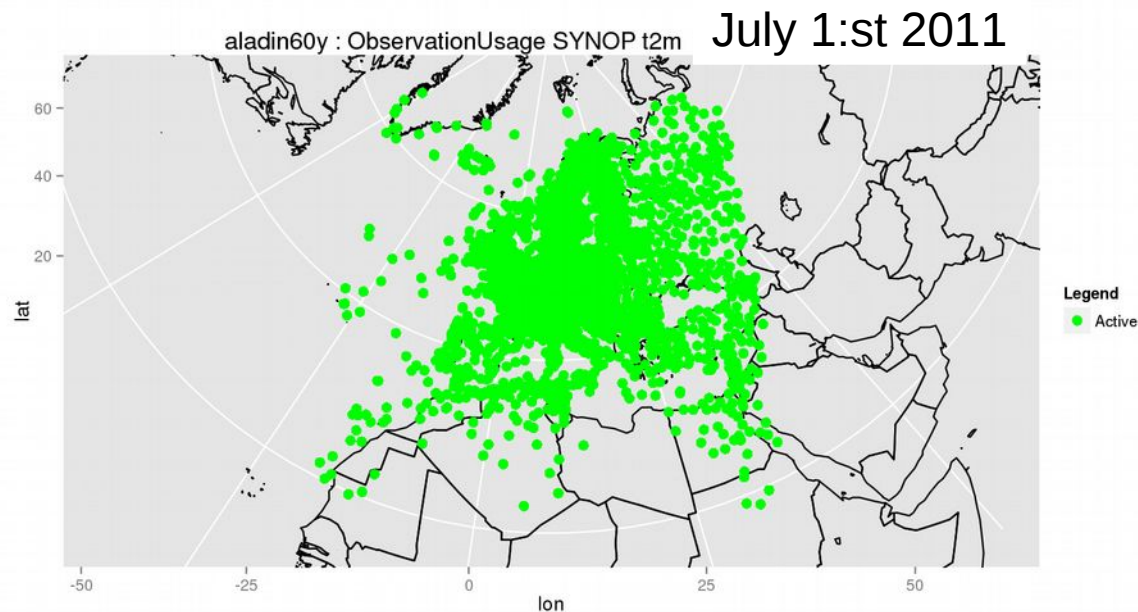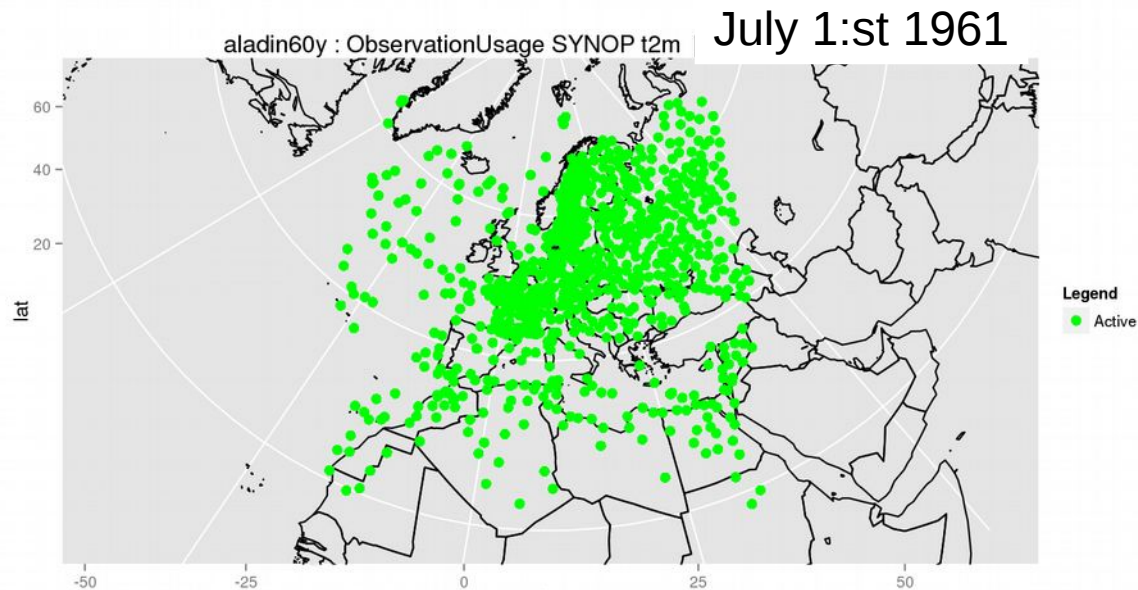- Now mostly automatic (amdar)

July 31:st 2000

Observation usage: aircraft

- With airep most observations comes from cruise levels.

- With amdar we also get data from ascent and descent phases of flights.

aladin60y : NumberOfObservations AIRCRAFT t [1980-07-01 12Z - 1980-07-31 12Z]

aladin60y : NumberOfObservations AIRCRAFT t [2011-07-01 12Z - 2011-07-31 12Z]

Observation usage: soundings

- Beginning of the 60:ties around 90 stations.

- Today around 140 stations.

July 1:st 1961

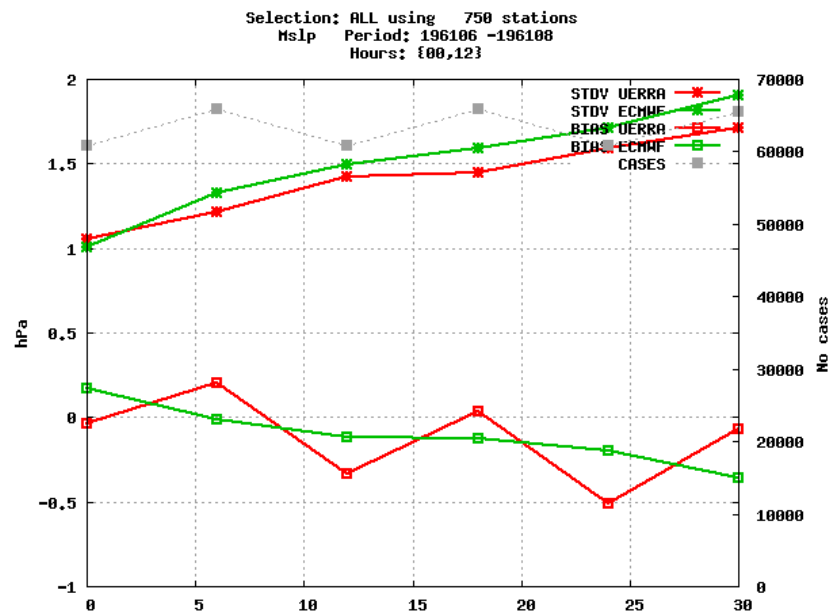July 1:st 2011

Observation usage: synop

- Denser network today compared to the early 60:ties.
- Some countries missing totally in the early archives.
- Manual addition of observations from MeteoFrance and SMHI 1961-1969
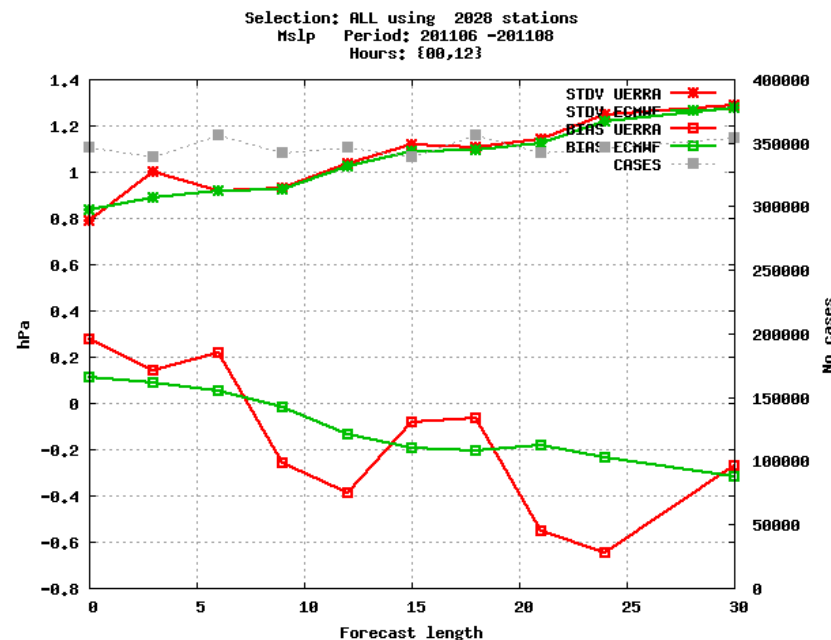
July 1:st 1961

July 1:st 2011

- The HARMONIE verification system has been used.

- Verification against SYNOP and TEMP.

- Comparison with ERA-40/ERA-interim.

- Seasonal scores.

- Slightly better STDV for UERRA 1961.

- Almost the same STDV 2011.

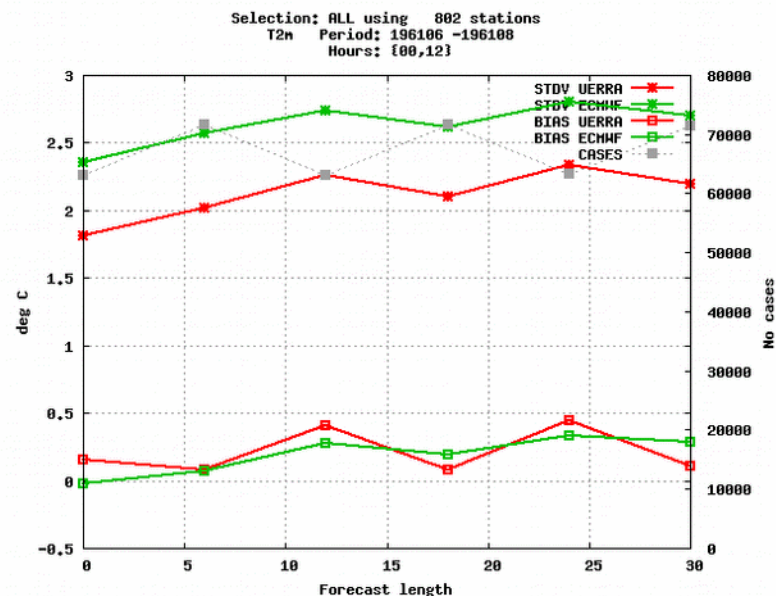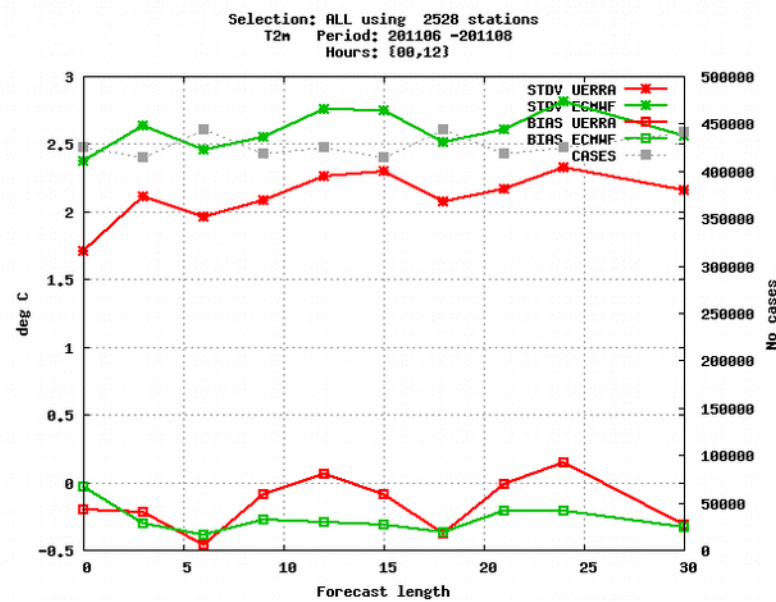- Strange BIAS behavior for UERRA.

JJA 1961

JJA 2011

- Clear advantage for UERRA in STDV both 1961 and 2011.

- The BIAS has gone from slightly positive in 1961 to slightly negative in 2011, both models.
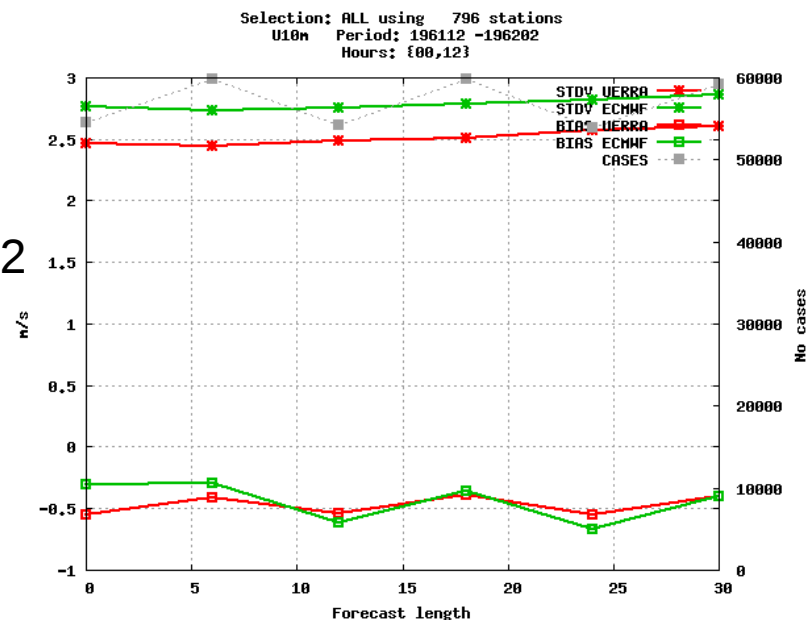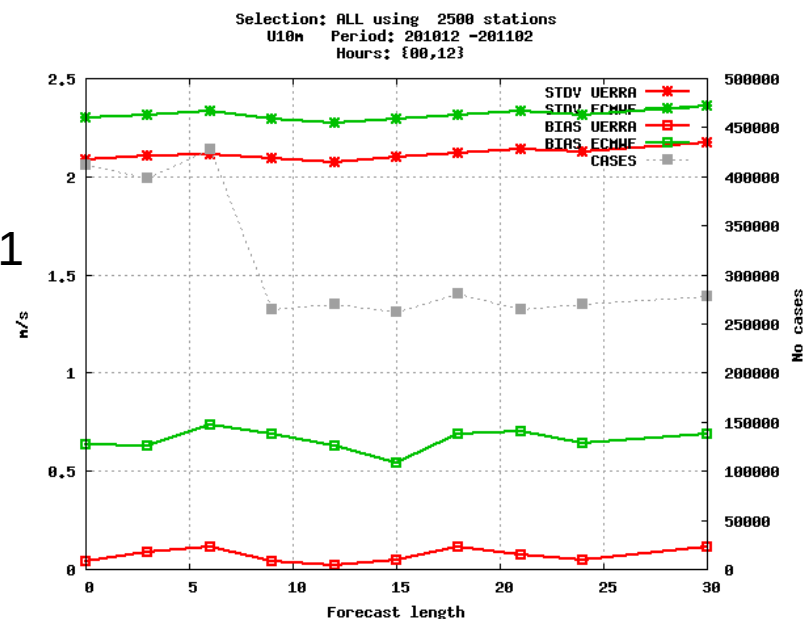
JJA 1961

JJA 2011

- Clear advantage for UERRA in STDV both 1961-62 and 2010-11.

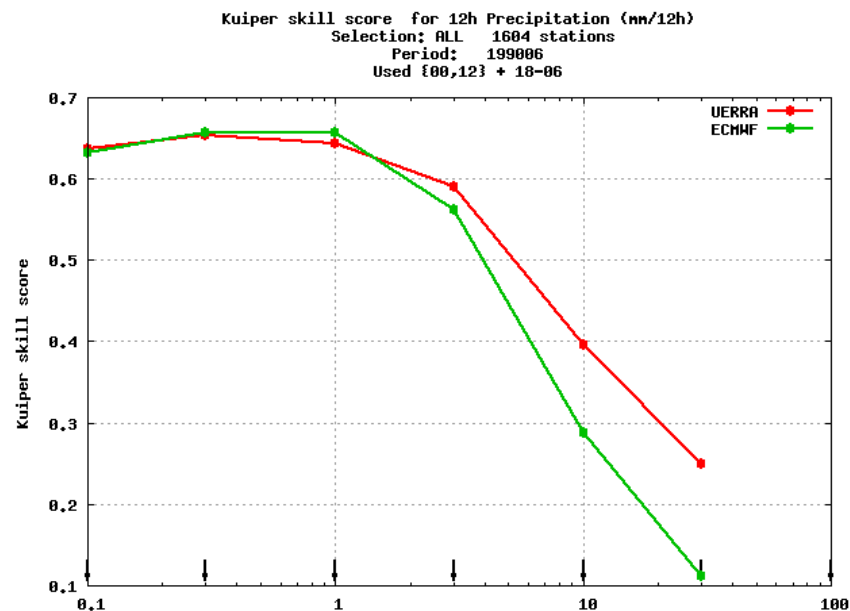- Significant change in BIAS, from negative to positive. Especially for ERA.
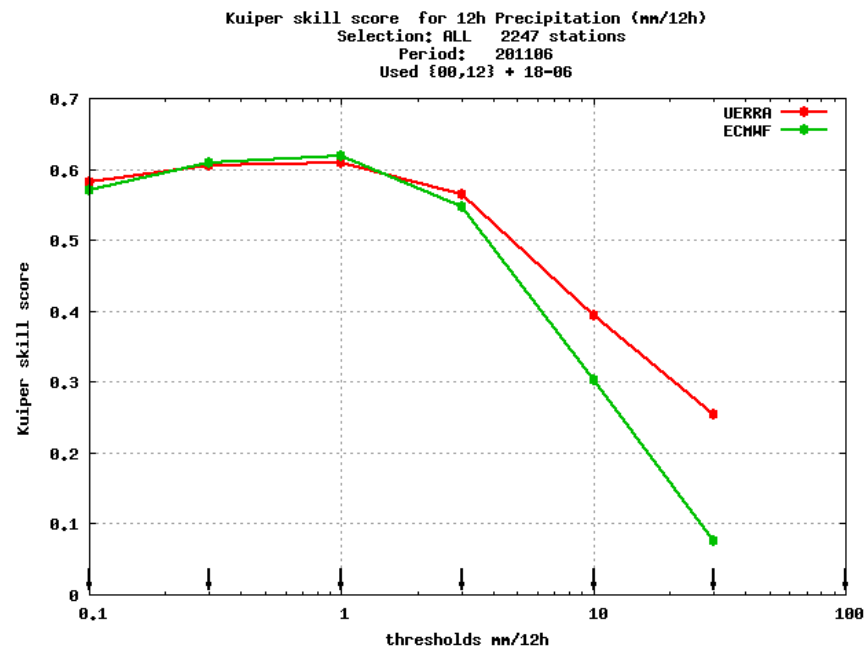
DJF 1961-1962

DJF 2010-2011

- Kuiper skill score.

- Similar for small precip amounts, UERRA a bit better for larger amounts.

JJA 1990

JJA 2011

- Harmonie output is stored in GRIB1.

- ECMWF has provided sample rule-files to convert our fields to GRIB2 using grib-api.

- Some of our parameters had to be re-calculated due to unit differences between GRIB1 and GRIB2
  - E.g. relative humidity and cloud cover

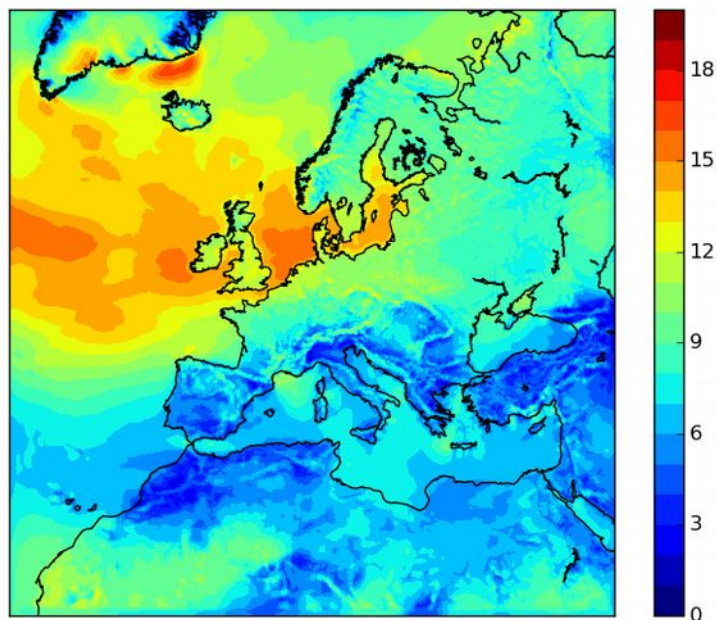- One GRIB2-file per day is put into MARS, ~ 8 GB.

- Five different level types; sfc, pl, ml, hl and soil.

- Analysis and Forecast; an and fc.

- Forecast lengths 00Z and 12Z:
  - 01, 02, 03, 04, 05, 06, 09, 12, 15, 18, 21, 24, 27, 30

- Forecast lengths 06Z and 18Z:
  - 01, 02, 03, 04, 05, 06

- Soil: 2 parameters, 3 levels (only 6 hour forecasts).

- Surface: 29 parameters.

- Model levels: 4 parameters, 65 levels (only analysis).

- Height levels: 7 parameters, 11 levels.

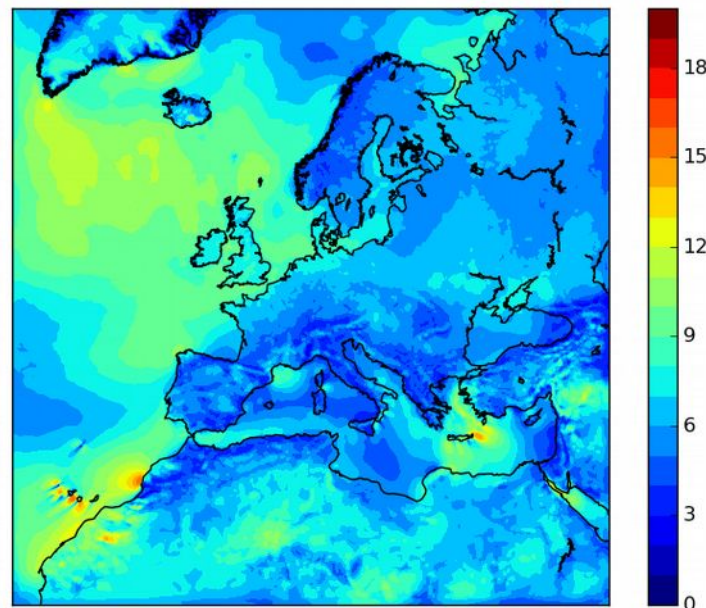- Pressure levels: 8 parameters, 24 levels.

- Present status:

    - 2007 and 2008 done.

    - Few days left for 2006.

    - Started 2009.

- One year takes approximately two weeks. Running two years in parallel, will take about a year to get it all in.

- Test retrieval: Mean wind speed at 150 m agl for January and July 2008

January 2008

July 2008

Thank you

Any questions?