

# Evaluation procedures and data

M. Borsche, A. K. Kaiser-Weiss, and F. Kaspar

UERRA Annual Meeting GA,  
Tortosa, Spain, 27./28. Jan 2015

# Summary of DWD contributions to WP3 in 2014

1. Evaluation procedures (D3.2, Borsche et al., 2015, *Methodologies to characterize the uncertainty of regional reanalyses*, submitted to ASR)
2. Comparison table (living document)
3. Parameter table (living document)
4. Explorative studies of scales of variability on global and regional reanalyses, comparison with in-situ measurements
5. Exploration of fitness for purpose of satellite data
6. Collaboration with WP4

# Outline

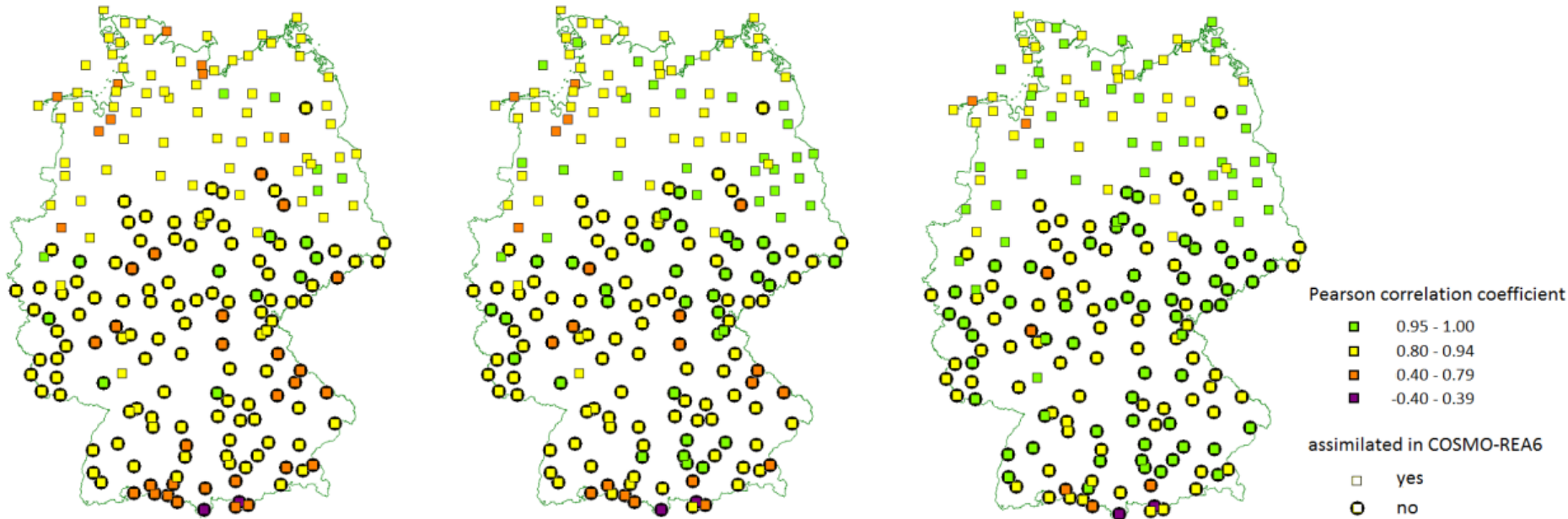
- Methods of uncertainty estimation
- Parameter table
- Comparison table
- Connection to WP4
- Next deliverable (M15): set of algorithms

# Method A: Feedback statistics

- Output of the assimilation system of assimilated observations
- Focus on radiosonde soundings
  - Temperature and wind speed
  - Try specific humidity
- Focus on lower troposphere
- Bias and RMSE on time series
- Measure for temporal stability

# Method B: Station observations

- Comparison against
  - Independent data, i.e., tall wind masts
  - Dependent data, i.e., Tx, Tm, wind speed; threshold values of Temp and Precip
- Large user interest
- Representativity issues



Pearson correlation coefficient of monthly means (calculated from daily wind speeds for 2007 to 2011) between station observations and reanalyses: ERA-20C (left), ERA-Interim (middle), and COSMO-REA6 (right).

*A. K. Kaiser-Weiss, F. Kaspar, V. Heene, M. Borsche, D. G. H. Tan, P. Poli, A. Obregon, H. Gregow: Comparison of regional and global reanalysis near-surface winds with station observations over Germany, submitted to ASR, 2015.*

# Method C:

## Gridded station observations

- Gridded data products: E-OBS, APGD
- Precipitation, Tmin, and Tmax
- Advantages: (1) data products carefully prepared, (2) covering desirable parameters, (3) cover desired region, (4) ready to use
- consider underlying station observations
- Large user interest

# Method D:

## Gridded satellite data products

- Data products by CM-SAF and CCI
- Parameters:
  - Global radiation, cloud liquid water path, snow water equivalent
  - Precipitation, total cloud cover



# Method E:

## Ensemble based comparison

- Ensembles measure inherent uncertainty
- Ensemble spread
- Apply methods A to D on:
  - Ensemble mean
  - Each ensemble member
- Apply ensemble based skill scores

# Method F: User models

- Surface and soil model SURFEX, Météo France
- Process based hydrological model HYPE, SMHI
- Driven by RRAs
- Comparison of output

# Comparison Table

- Published and available to all WP3 on google drive
- Compare all planned UERRA RRAs
- Aim: publish on [www.reanalysis.org](http://www.reanalysis.org)

# Parameter table

- Published and available to all WP3 on google drive
- Preparation to define UERRA output
  - Levels
  - parameters

# WP3 connection to WP4

- WP3 needs RRA output to work with
- Available data: EURO-4M and COSMO-REA6
- WP4 is setting up a testbed
- Refer to talk of Richard Mladek

# Outlook: set of algorithms

- Set-up an r-package (together with MI, KNMI)
- Organize it in a git(Hub) repository with excess to everyone
- Features:
  - Read RRA data (from MARS)
  - Read reference data (to be defined; user specific)
  - Apply uncertainty estimates following the methods outlined above
  - Use verification package; other available know-how
  - Modular, i.e., easily expandable
- Need to check legal issues (i.e., licensing)