# PP INSPECT status

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(1) RHM (a.bundel@gmail.com), (2) HNMS, (3) DWD, (4) MCH, (5) IMGW-PIB, (6) ARPA-SIMC, (7) ARPA-PT

COSMO GM, 5-9 September 2016, Offenbach

# Status highlights

- The PP INSPECT is extended until August 2017 due to delays in some tasks, with overall FTE amount almost unchanged
- Delayed tasks in question are extended with unused FTEs shifted to later periods

# Tasks involving reruns of MesoVICT test cases

- MCH: COSMO-1 reruns for ALL MesoVICT cases are DONE and available at WG5 repository
- ARPA-SIMC: ECMWF-IFS reruns for cases 1 and 2
- COSMO-Ru2-EPS: rerun for the 1st MesoVICT case
- MCH: Probably, at least one COSMO-E run could be made until the end of this year, if the initial and boundary conditions from ECMWF-EPS (IFS-ENS) are suitable for COSMO-E

**This created a base for the application of spatial methods to ensembles (INSPECT priority) and comparison of deterministic and ensemble approach for a family of COSMO models of different resolutions**

# Tasks involving development of routines for running spatial methods

- RHM, HNMS, INGW-PIB: examples of scripts for neighborhood methods, CRA, SAL, and MODE are uploaded at the WG5 repository, but the documentation is still very limited

- *ARPA-PT:* ***It was decided to add two new developments of high priority for the project in VAST: inclusion of time dimension and the possibility to operate with other variables besides precipitation, primarily TCC***

# The policy on Additional Verification Tools and verification data and formats

- *HNMS, RHM. IMGW-PIB*: **The policy on Additional Verification Tools and verification data and formats** is prepared and sent to TAG for consideration.

# Tasks involving the application of spatial methods to deterministic forecasts

- Progress in application of the routines developed earlier **to MesoVICT cases** -> this should facilitate the comparison of different approaches and summarizing the results

# Wind verification with DIST method: preliminary results

Maria Stefania Tesini

Offenbach - 6 September 2016

COSMO General Meeting

# Application to MesoVict cases 1-3

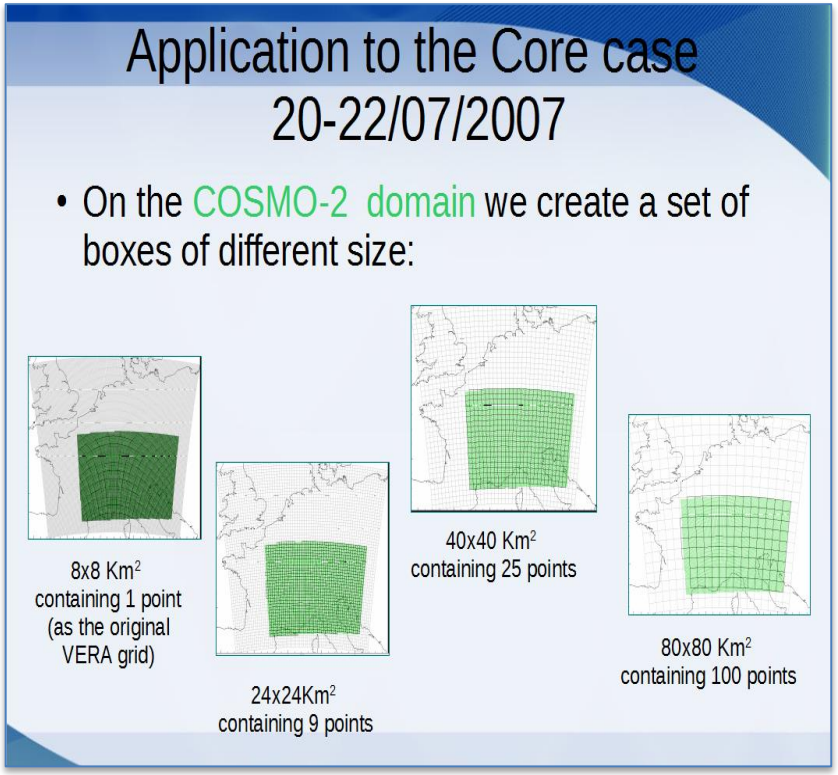
- Available data:

  Observations: VERA analysis ( 8 Km grid)

  Forecasts: COSMO-2 interpolated on the VERA grid, COSMO-1 model (original grid)

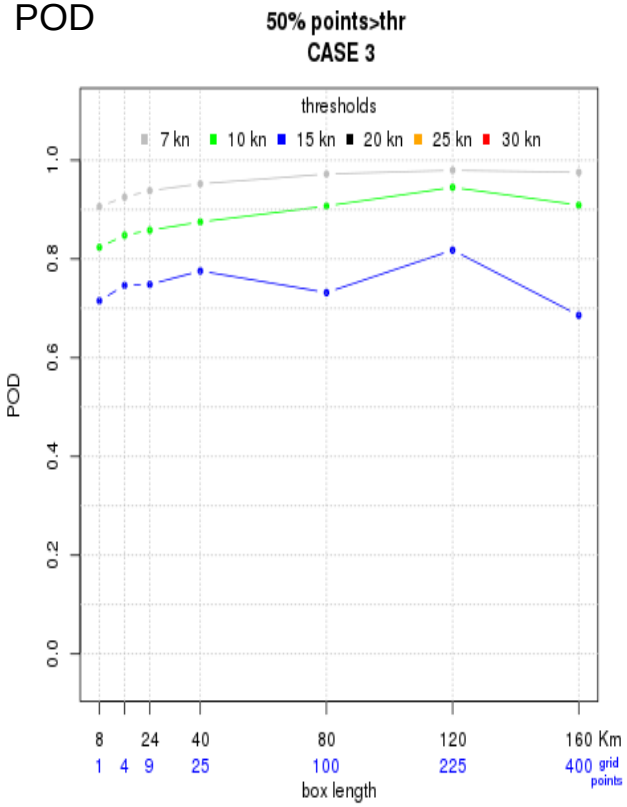
- Several sets of boxes were created:

| Dimension of box in Km | Grid points in the box | Points in the box with time aggregation |
|---|---|---|
| 8x8 | 1 | 3 |
| 16x16 | 4 | 12 |
| 24x24 | 9 | 27 |
| 40x40 | 25 | 75 |
| 80x80 | 100 | 300 |
| 120x120 | 225 | 675 |
| 160x160 | 400 | 1200 |

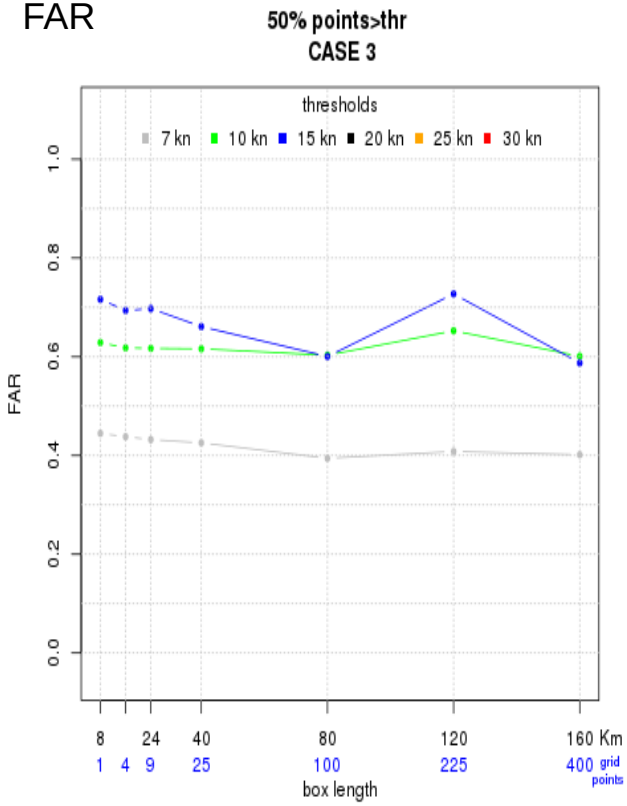


# WIND SPEED case 3 – Cosmo-2 50%

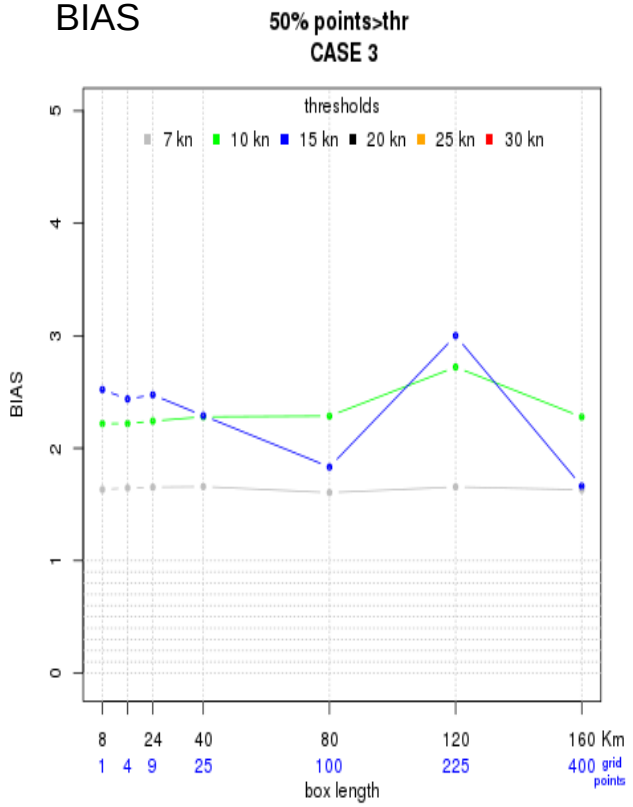
POD




FAR



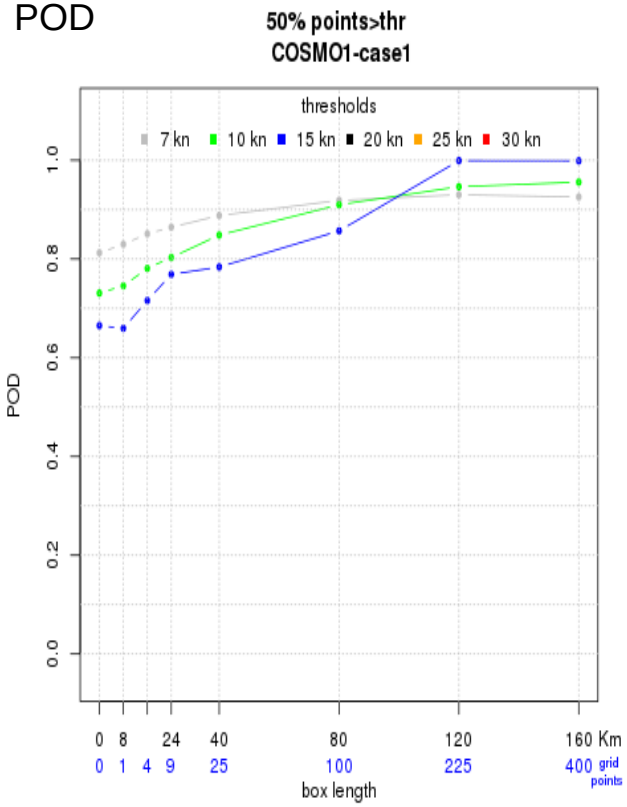

BIAS



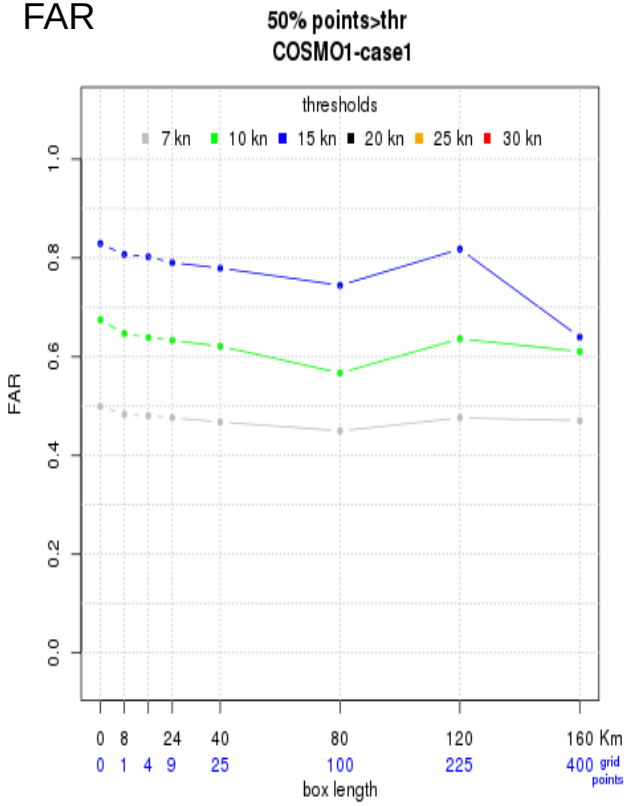

The event is defined as “median exceeding a predefined threshold”
The scores are plotted as a function of the box dimension

# WIND SPEED case 1 – Cosmo-1 50%

POD




FAR

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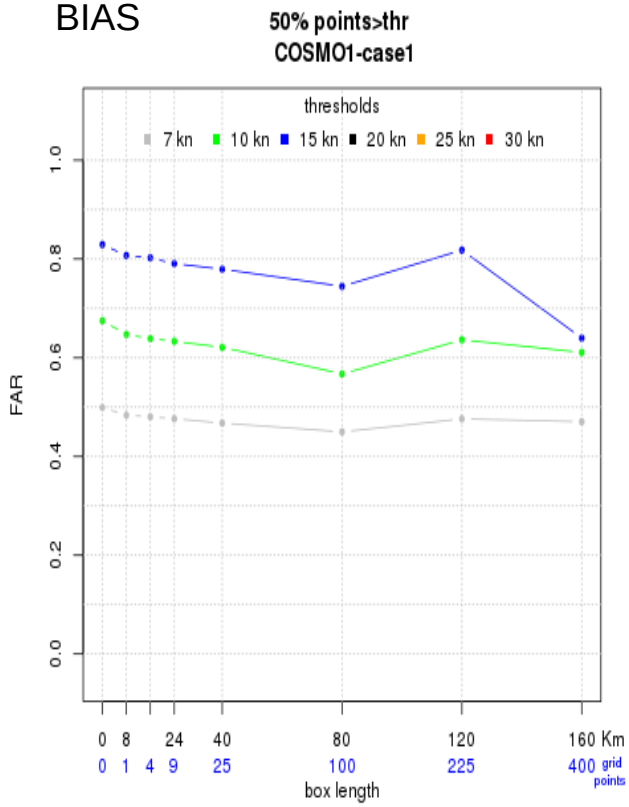


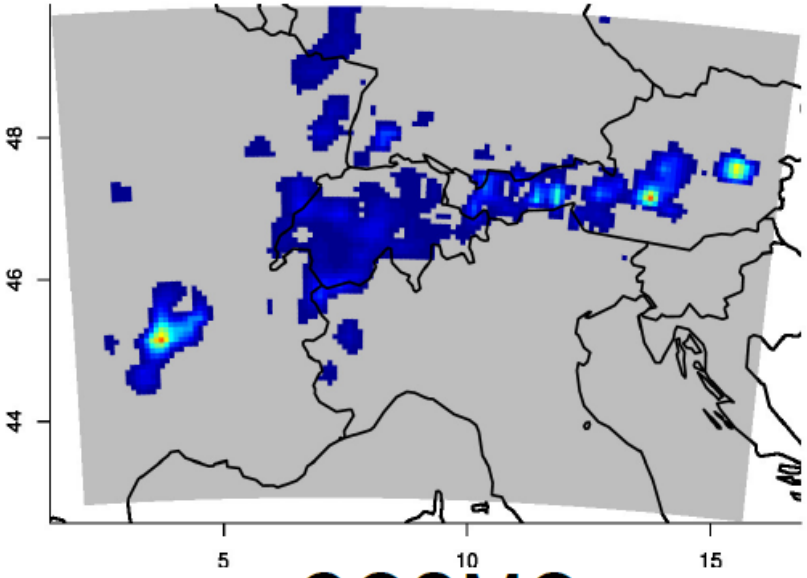

The event is defined as “median exceeding a predefined threshold”
The scores are plotted as a function of the box dimension

# Highlights of PP INSPECT results at IMGW-PB

Joanna Linkowska
Andrzej Wyszogrodzki
IMGW-PIB

VERA

**2006 07 20, 18 UTC**



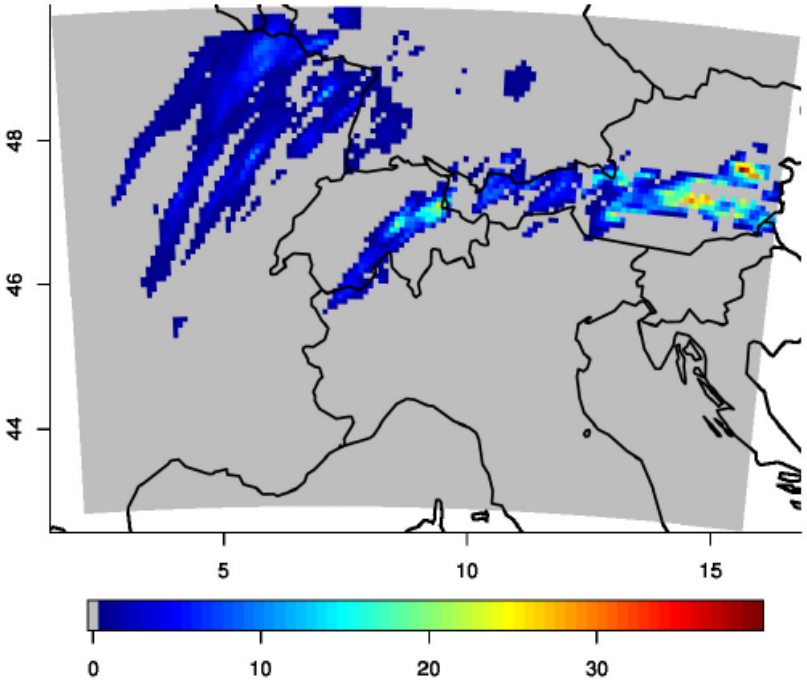

**COSMO**

**S**=0.11 **A**=0.22 **L**= 0.26

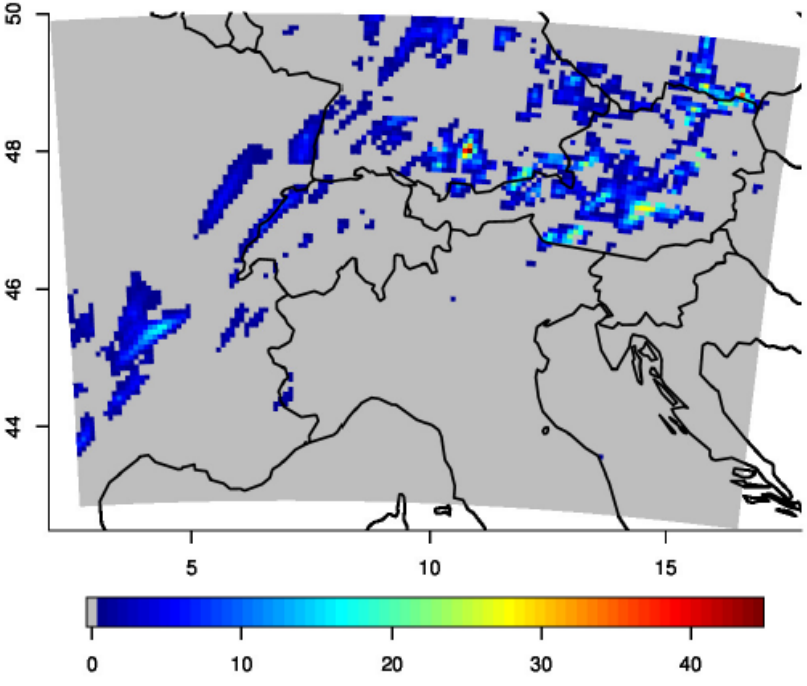
**CMH**

**S**=-0.59 **A**=0.22 **L**=0.25

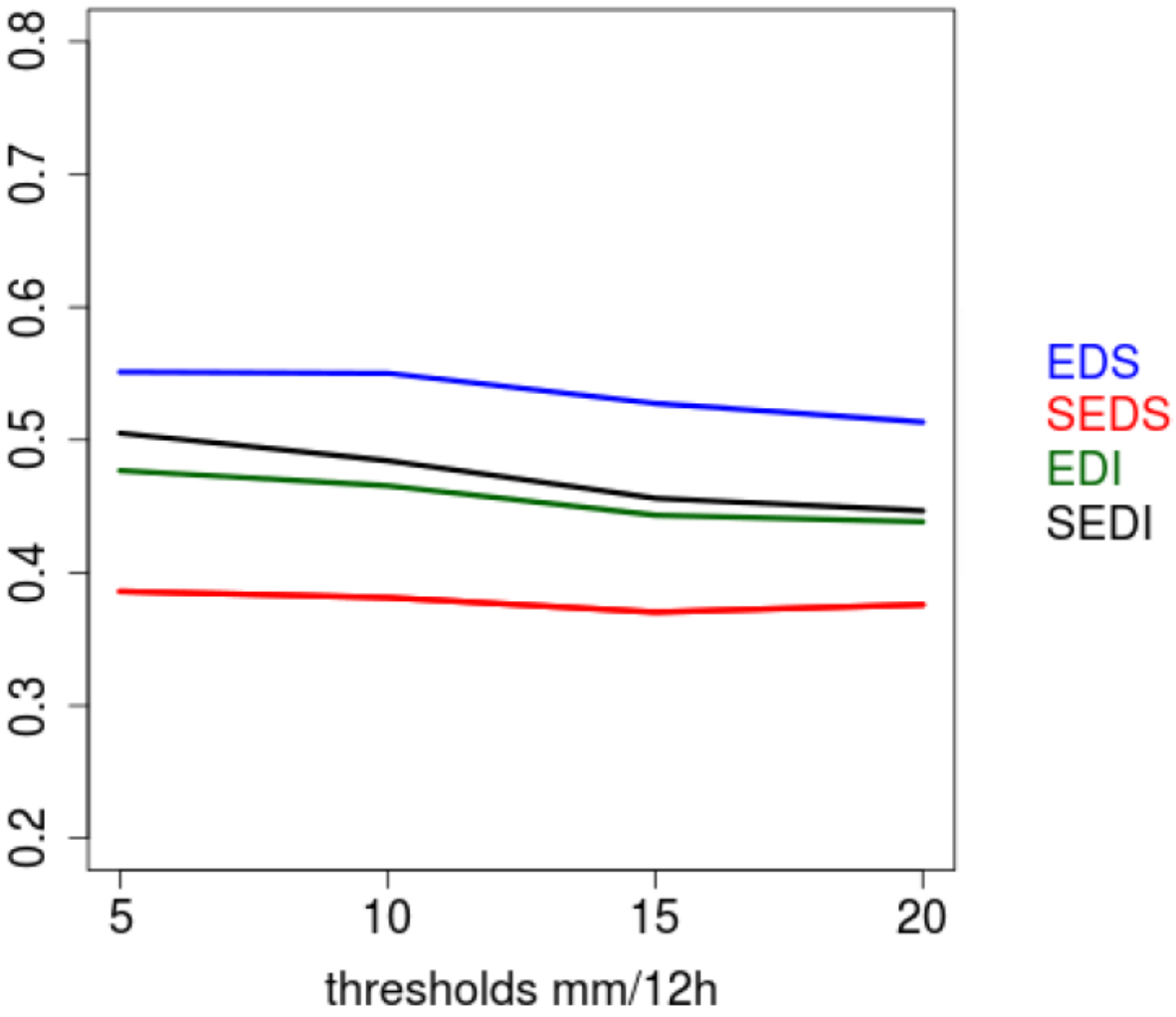
COSMO




CMH



# Extreme events scores



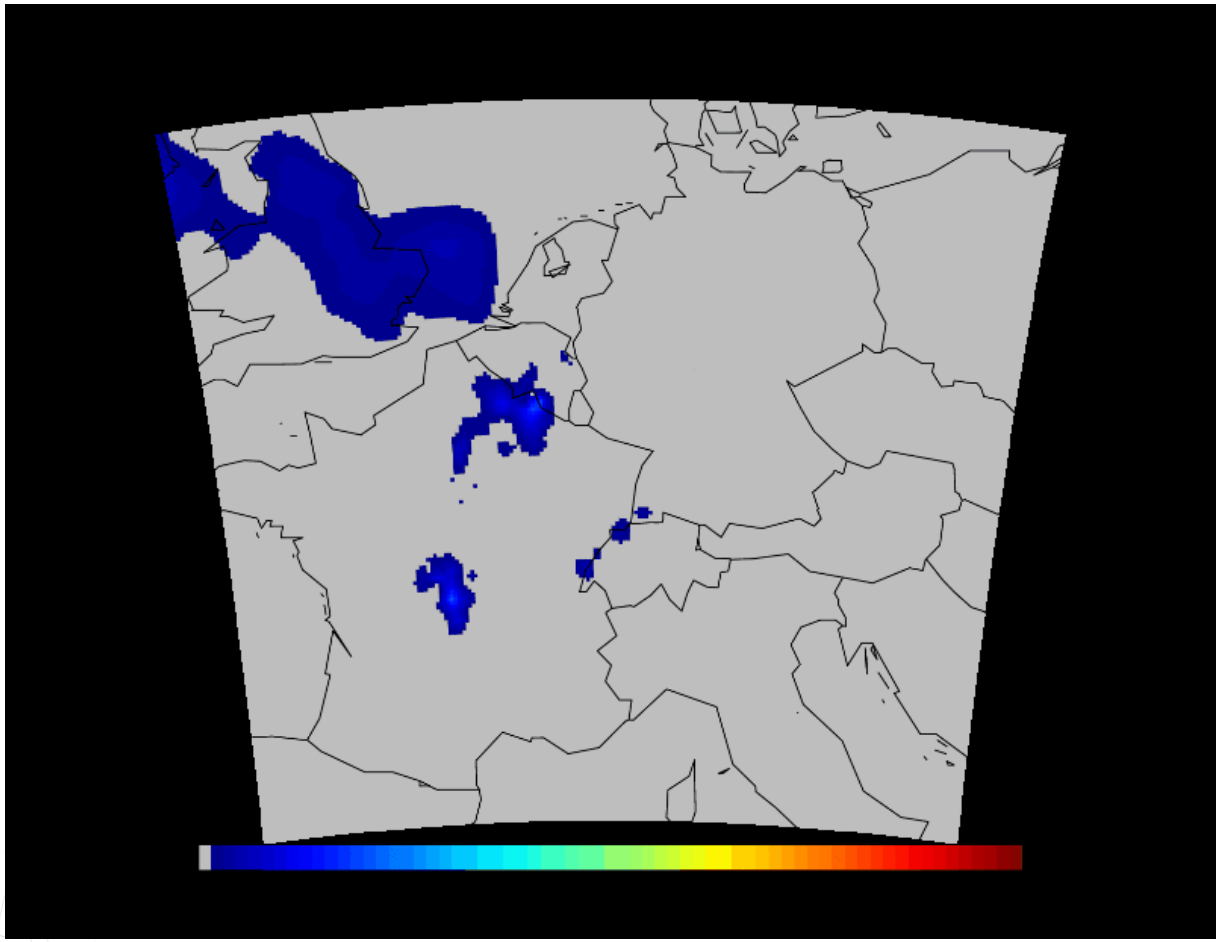
# Matching objects and CRA application for MesoVICT cases (RHM)

**A. Bundel and A. Muraviev**

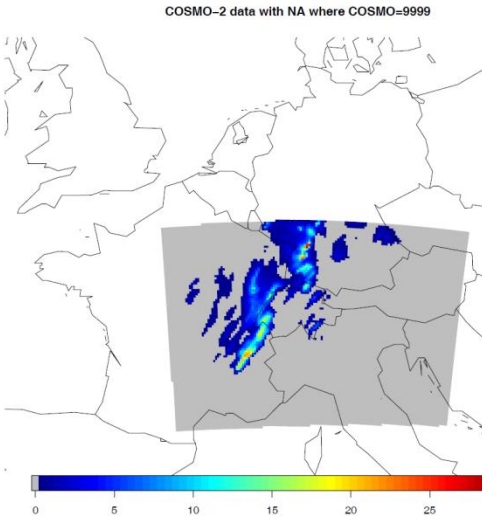
# MesoVICT case 1 (core case): 20-21 June 2007

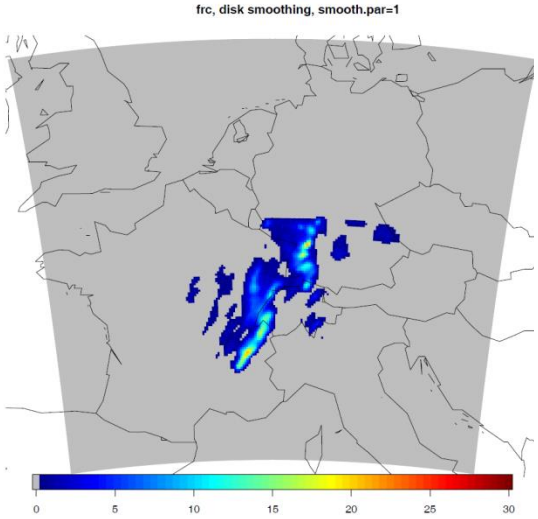
Strong convective developments north of the Alps followed by a cold front the next day. Cold air mass could not spill over the Alps.

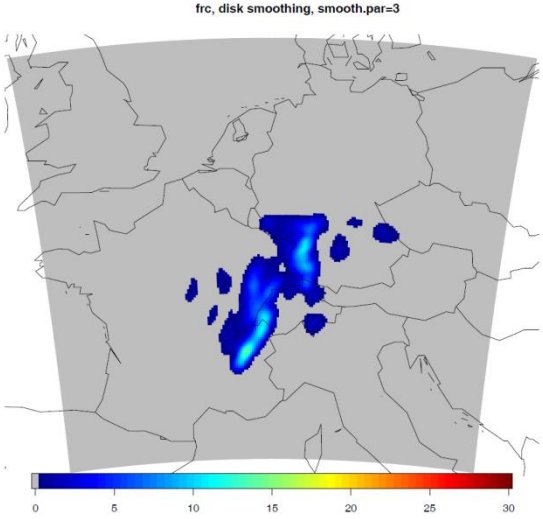
The most intense precipitation: during June 21 afternoon

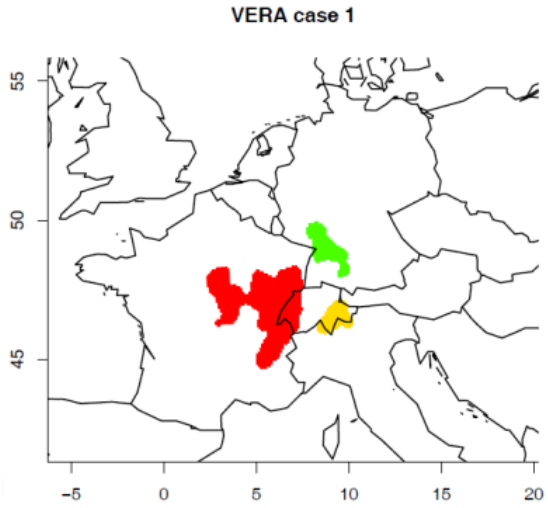


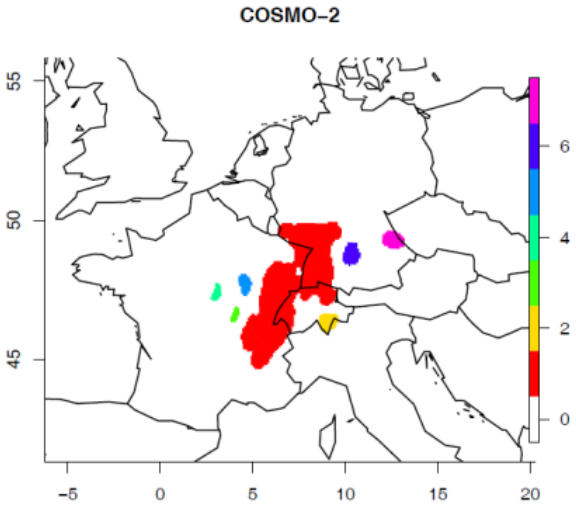
# Experiments on smoothing the COSMO-2 field, 2007062106



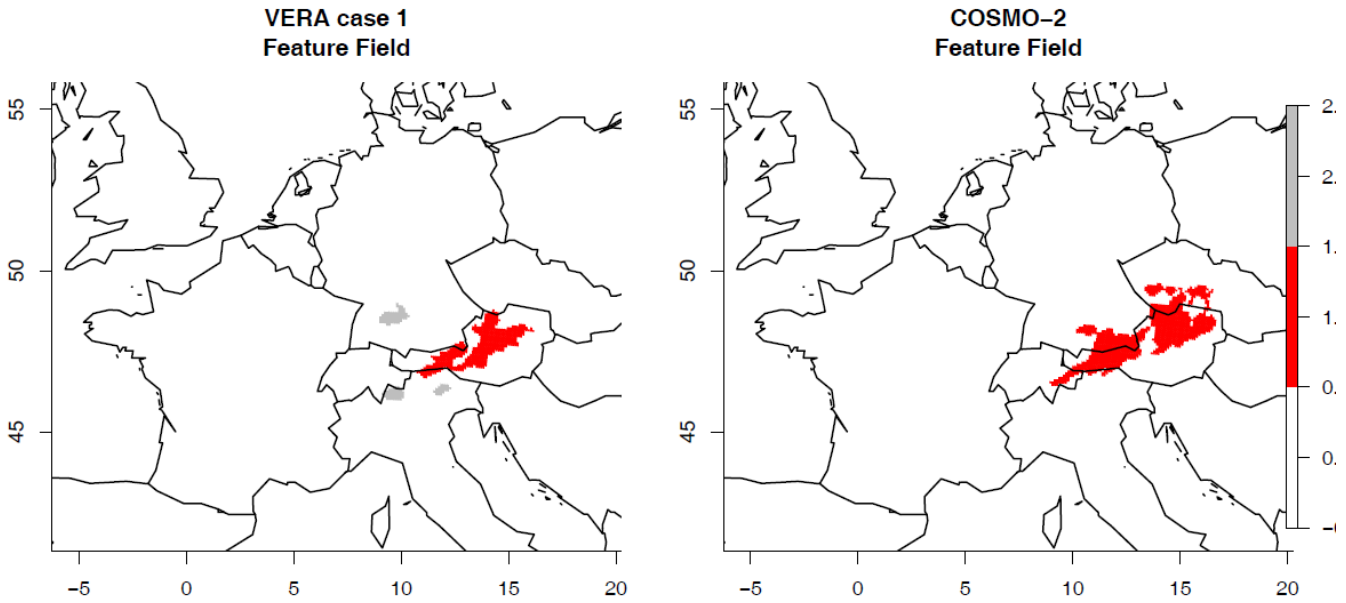




**Features, smoot.par=3,**
**Min.size=20 grid points**
**(~36*36 km)**
**precip threshold=0.5 mm/h**

**Do we need smoothing for more intense precipitation?**
**Probably, not.**

# CRA scores, 2007062115, intense precipitation

Centmatch 2




| ir | MSE.total | MSE.shift | MSE.displace | MSE.volume | MSE.pattern |
|---|---|---|---|---|---|
| 1 | 0.0193 | 0.0165 | 0.0028 | 0.0002 | 0.0163 |

In most cases, most of the error is due to fine scale structure (MSE.pattern)

# Tasks involving the application of spatial methods to ensemble forecasts

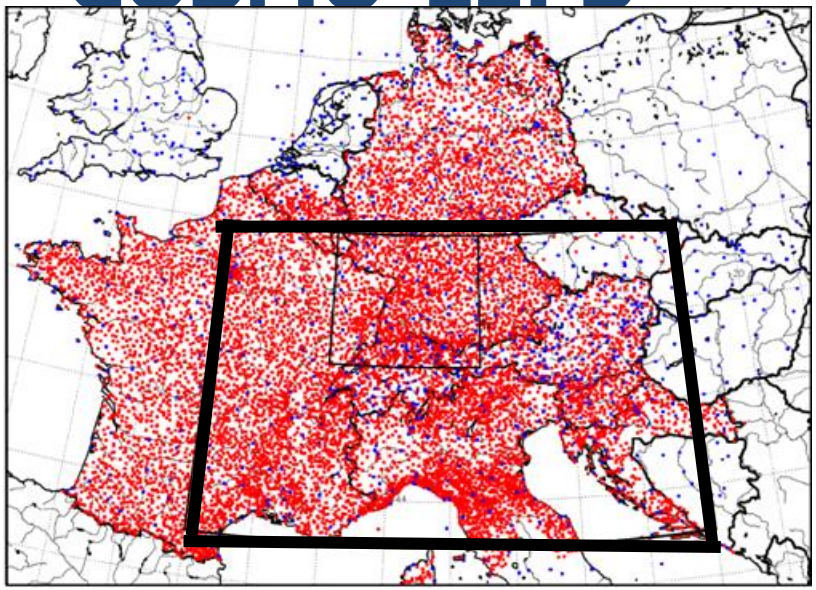
- A progress is made, although some of these tasks are delayed

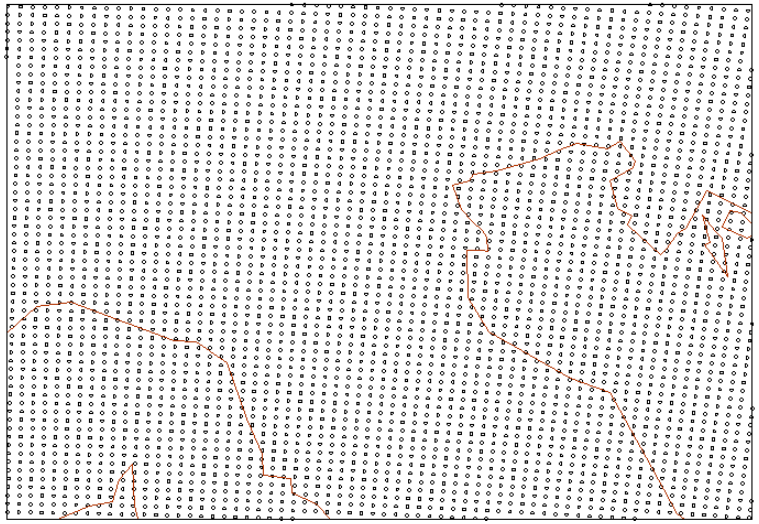
# Sensitivity of COSMO-LEPS forecast skill to the verification network: application to MesoVICT cases

**Andrea Montani**
*Arpae Emilia-Romagna Servizio IdroMeteoClima, Bologna, Italy*

COSMO WG5/INSPECT

# Objective verification of COSMO-LEPS





## Main features:

variable: 6h cumulated precip (0-6, ..., 18-24 UTC);

period: from 20 to 22 June 2007;

region: 43-50N, 2-18E (D-PHASE area);

method: nearest grid point; no-weighted fcst;

**obs: JDC or VERA;**

fcst ranges: 0-6h, 6-12h, ..., 42-48h;

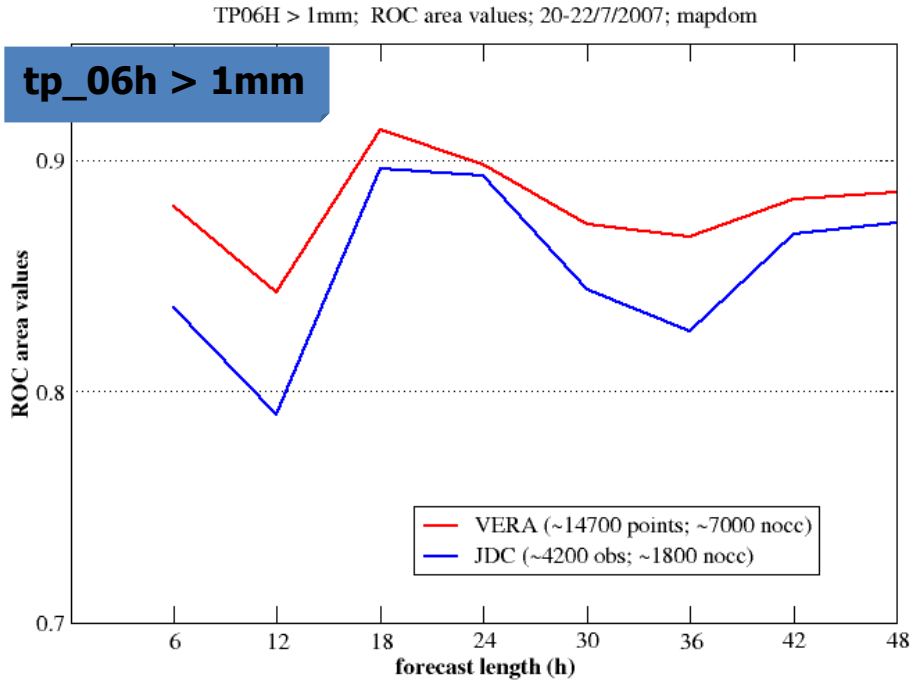
thresholds: 1, 5, 10, 15, *25*, *50* mm/6h;

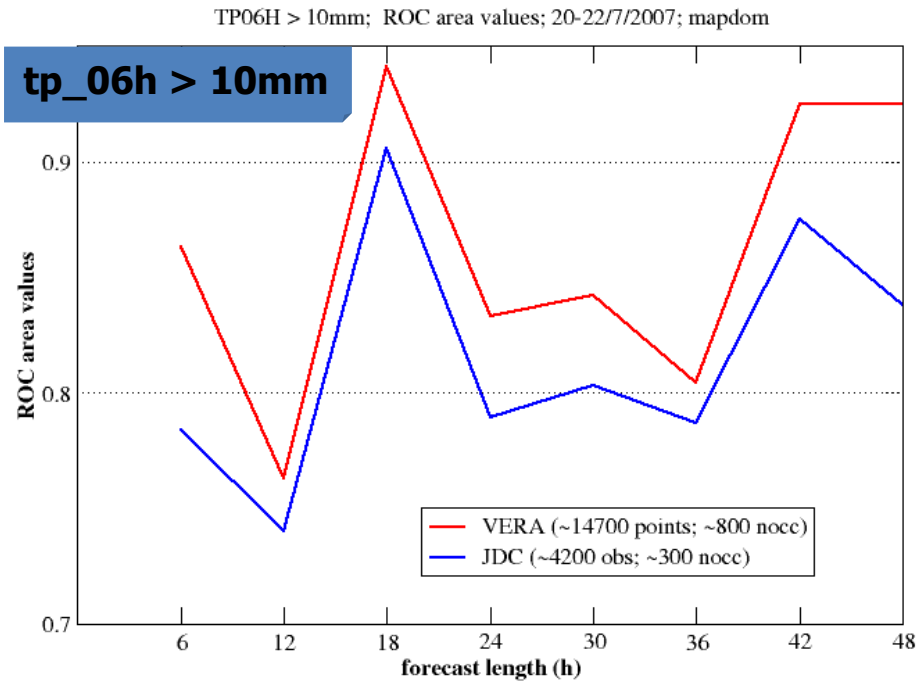
system: COSMO-LEPS;

scores: ROC area, RPS, RPSS, Outliers, ...

# Probabilistic prediction of tp: ROC area

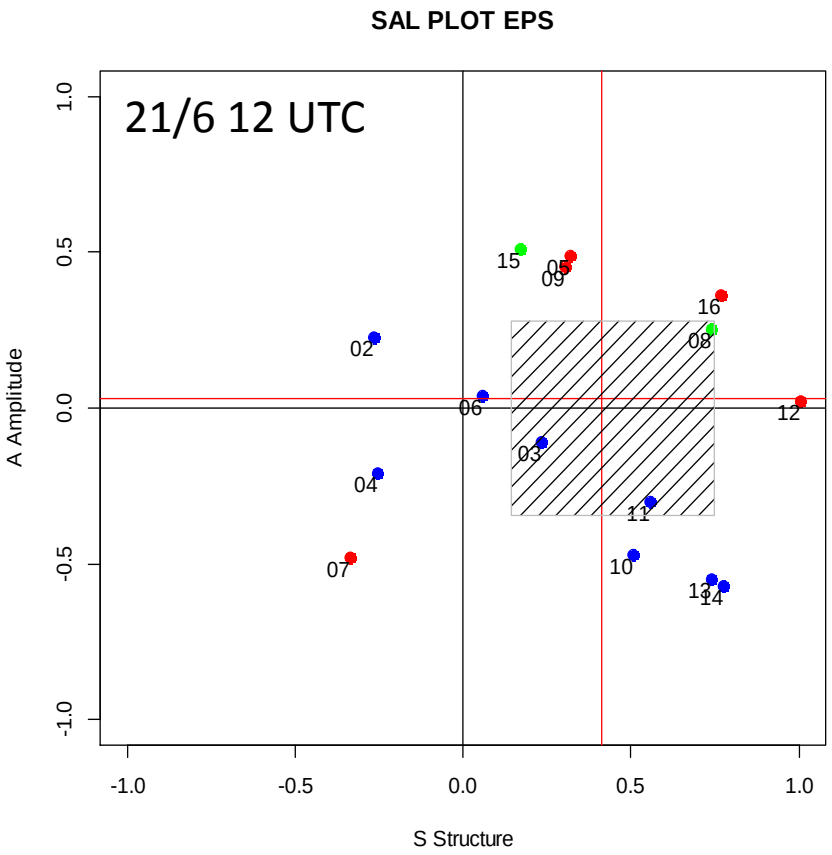
- Area under the curve in the HIT rate vs FAR diagram; the higher, the better …
- Valuable forecast systems have ROC area values > 0.6.
- Consider two events: 6-hour precipitation exceeding 1 mm and 10 mm.

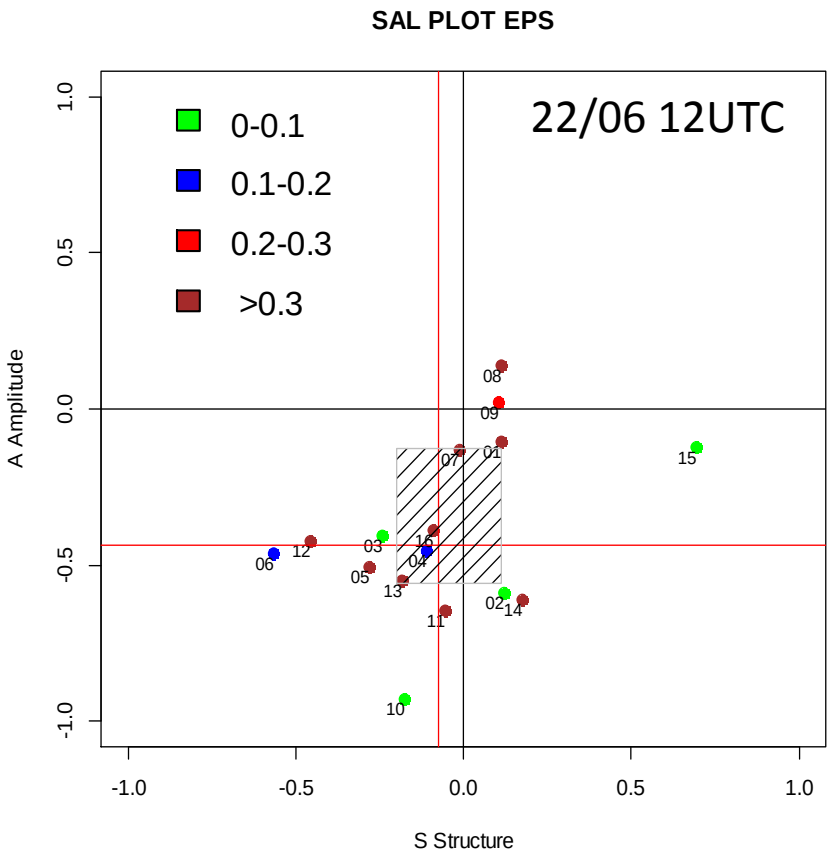



- Similar performance of the system with respect to the 2 verification networks.
- Higher skill when COSMO-LEPS is verified against **VERA** gridded analysis (different number of occurrences for the 2 networks) .

# SAL for COSMO-LEPS




S> 0 too large or too flat objects are produced.

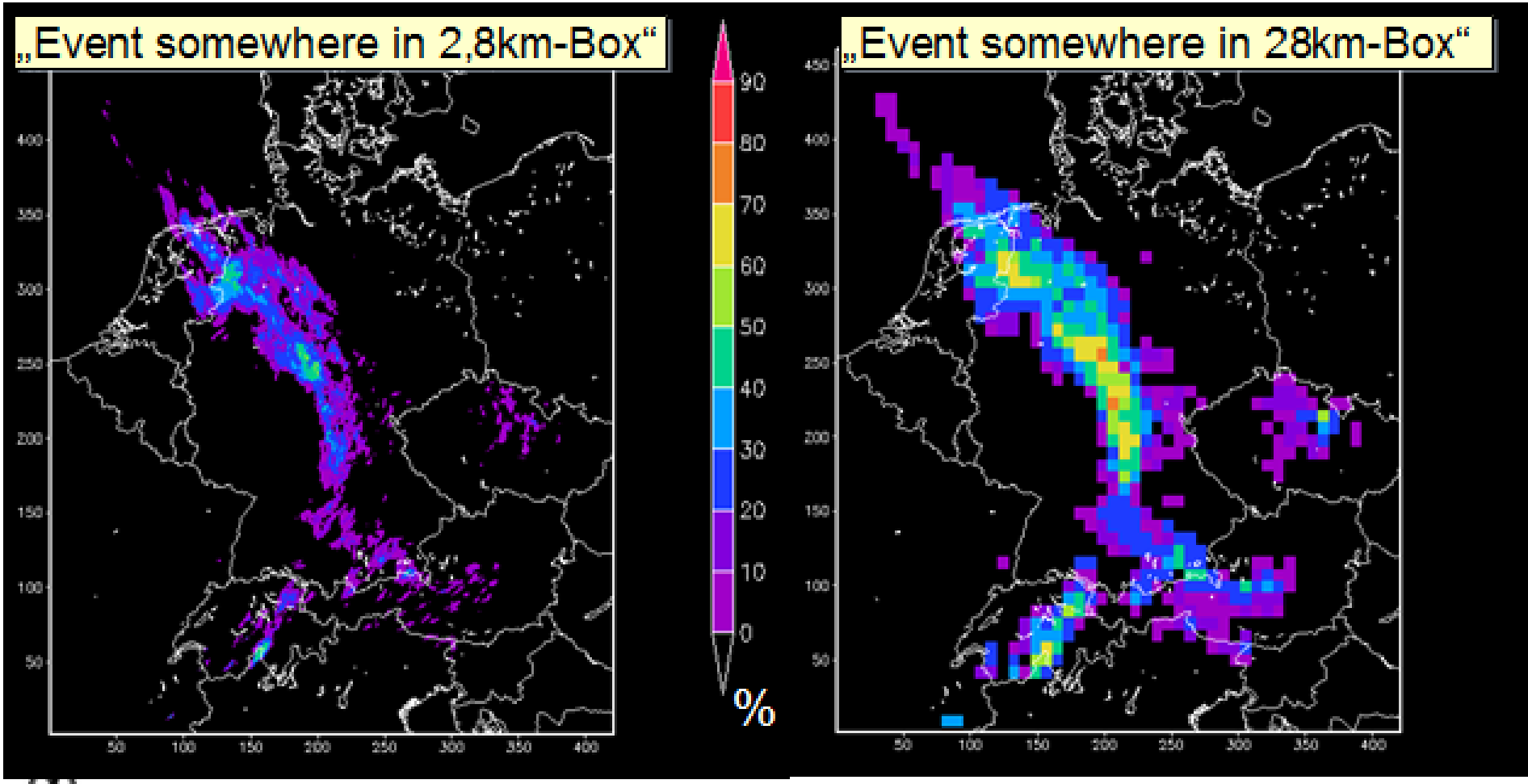
A<0 underestimation, More red points

# Spatial Verification for Ensemble at DWD

**Susanne Theis**

**Deutscher Wetterdienst (DWD)**

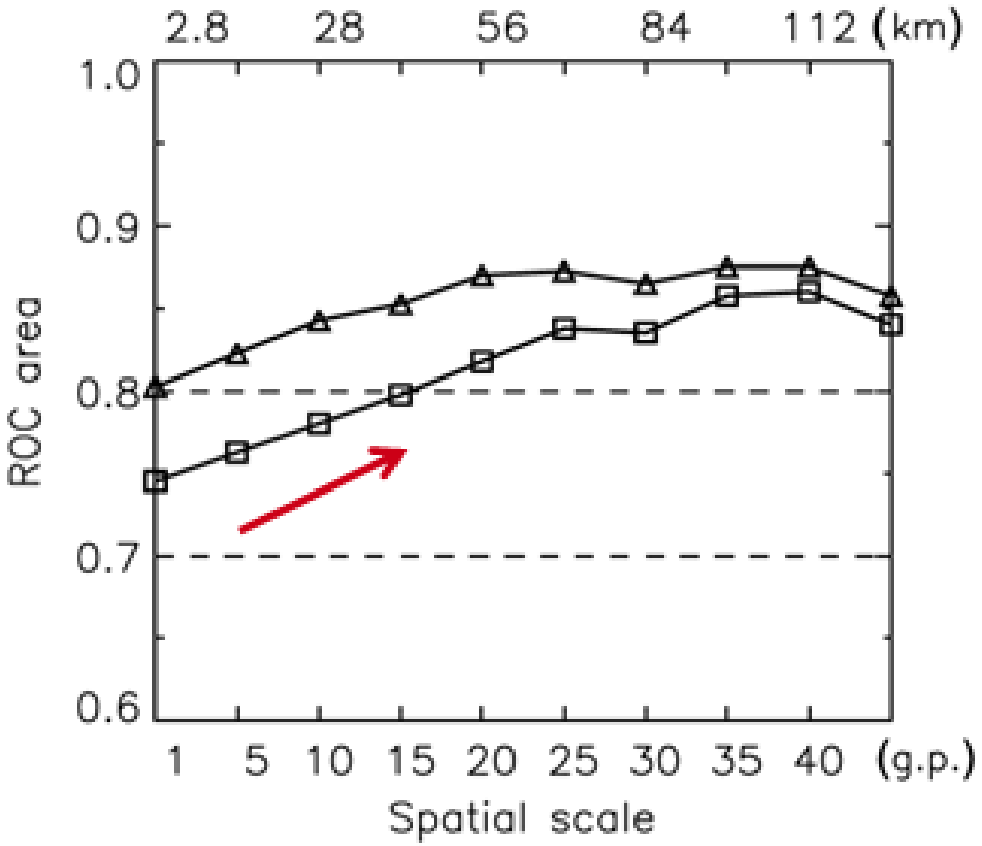
# EPS Product Example: Probability Maps




*Source: EWGLAM / SRNWP meeting, Athens, 2009*

# Verification Results






**The balance between good verification results and access to fine-grid information**

Observations:

Radar data,
upscaled in the same way

Figure 6. ROC area as a function of the window size used for the uspcaling process. The triangles refer to a threshold of 10 mm $(6\,h)^{-1}$ and the squares to a threshold of 20 mm $(6\,h)^{-1}$.

# Follow-up of MesoVICT

- **The 2nd MesoVICT international meeting will be held in Bologna, Italy, on 21-23 September 2016 under the umbrella of ARPA-SIMC.**
- **During the same period, the INSPECT meeting will also take place**

  ***During the INSPECT meeting in Bologna, we plan to summarize the last outcomes of MesoVICT and to decide the next steps within INSPECT for the last year of the project***

# Thank you for your attention!

# Task 5: Guidelines for relative usefulness of various spatial methods in decision-making

**<u>Goal:</u> Using the knowledge gained from INTERP, ICP and MesoVICT projects and the long time series of spatial verification scores, to try to identify the relative usefulness of each spatial method for precipitation and other weather parameters. To propose a kind of Guidelines for using spatial methods within the COSMO community**

- Most of subtasks in Task 5 will start in October.
- To simplify the preparation of the Task 5 deliverables, a paper needs to be prepared by the participants for each method tested that will reflect the experience gained