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# **WG4: interpretation and applications**

## **overview and plans**

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# Topics



- FIELDEXTRA → presentation by JM Bettems
- CORSO → presentation by G. Rivin
- CORSO-A → presentation tomorrow
- Science plan and scope of WG4



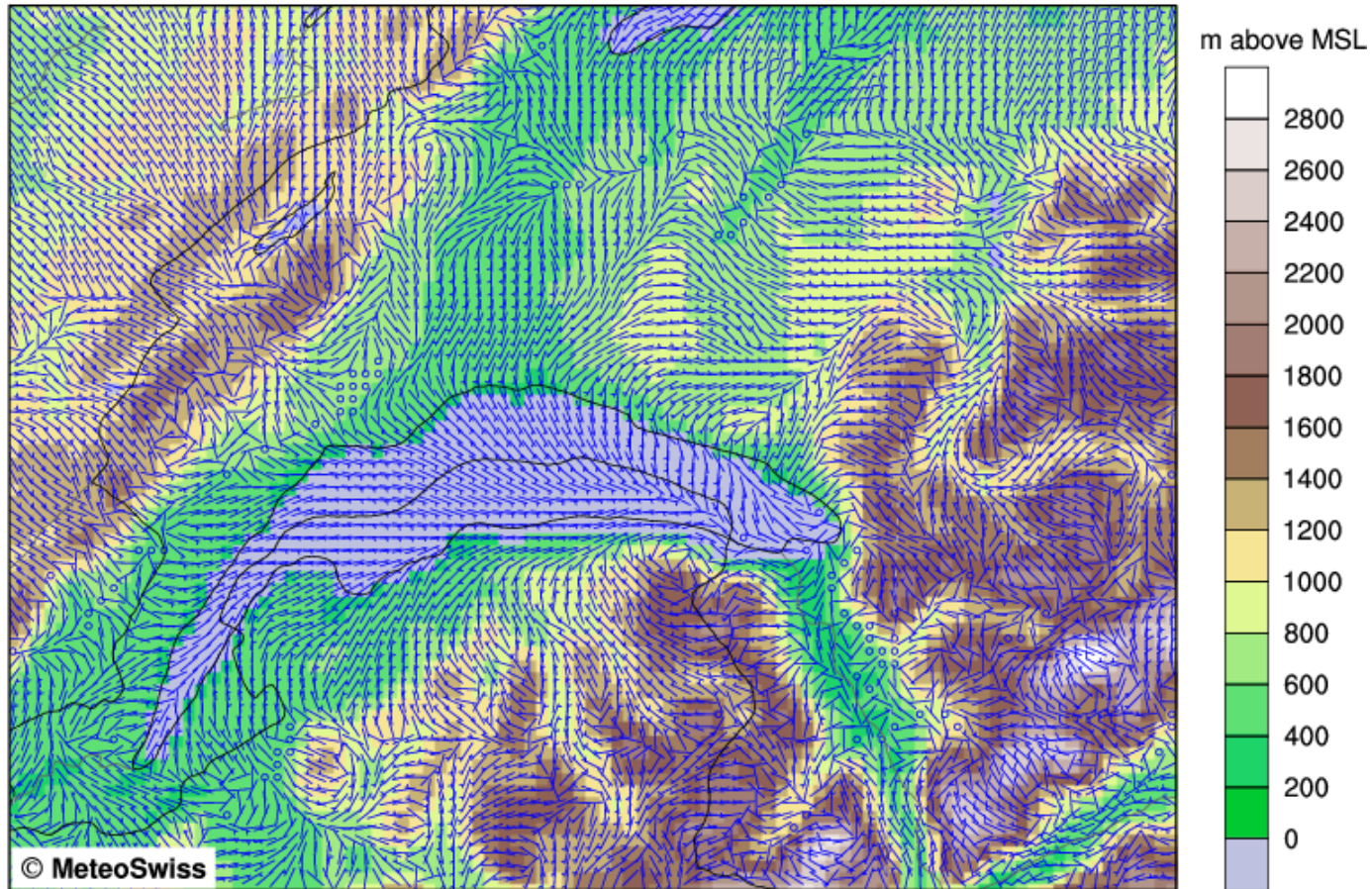
# COSMO-1



COSMO-1 FORECAST  
10m WMO Wind Flag and Orography

Version: 570

Tue 09 Sep 2014 15UTC  
09.09.2014 00UTC +15h



wind barbs

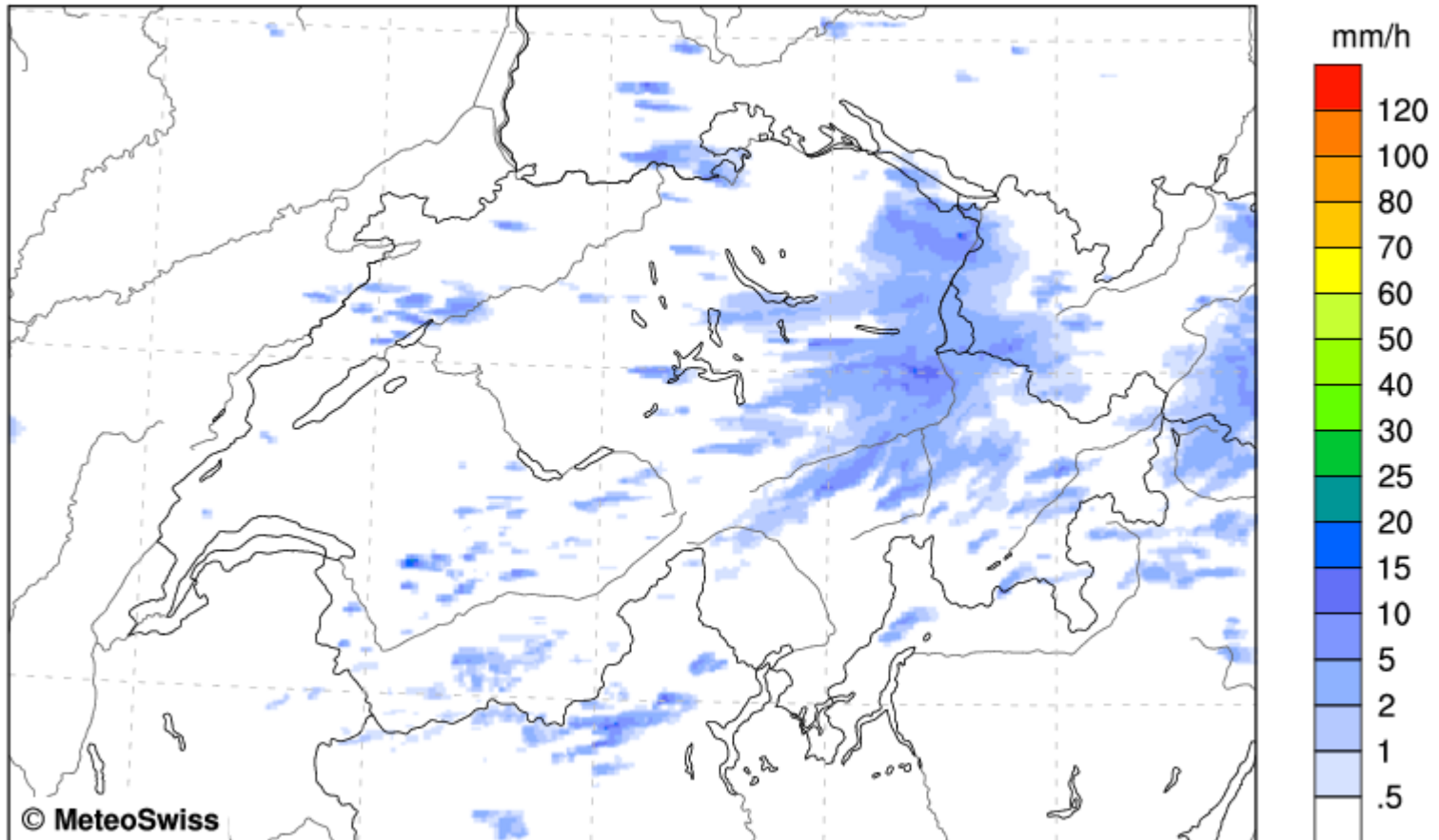


# COSMO-1

COSMO-1 FORECAST  
Hourly Sum of Total Precipitation

Version: 570

Tue 09 Sep 2014 13UTC  
09.09.2014 00UTC +13h

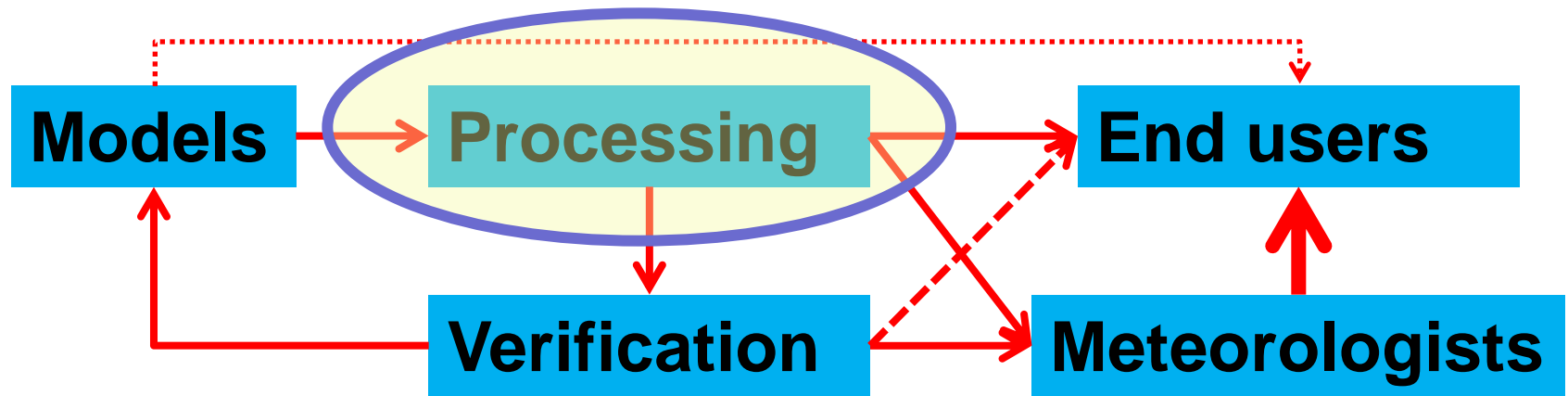


Precipitation Amount [ $\text{kg m}^{-2}$ ]

Mean: 0.328 Max: 20.859 [ $\text{kg m}^{-2}$ ]

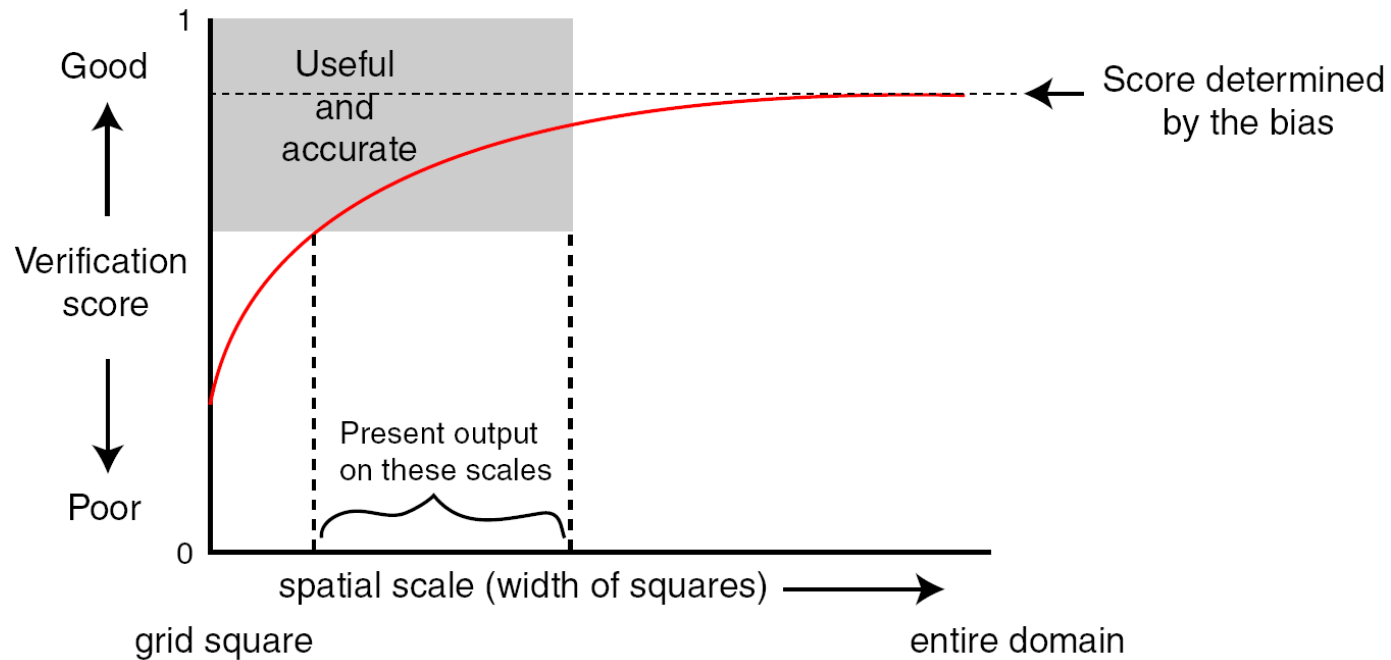


# Models downstream





# Spatial aggregation





# Science plan



The goals of developing (post)processing at the consortium level are:

1. to help understanding the characteristics of model output and provide **methods** to analyse (space, time, parameter, ensemble member) combinations of the output fields; this process should be supported by corresponding verification methods.

1. to provide the users of models (including meteorological forecasters) with recommendations of use of model output; this goal only can be reached by exploiting the conclusions drawn in point 1.





# Verification und best practice



- Always (and only) use (show) what is qualitative best (→ verification!). As working basis to the forecasters as well as for end users.
- Each deterministic forecast product (forecasters and end users) should be accompanied with an error bar.
- Ideally the users receive only verified products, resp. Only the parameter combination verifying best. For instance for precipitation a neighbourhood average or quantile.





# (Post)processing



- Processing priorities for COSMO-E:
  1. median, (mean), ctrl, quantiles;
  2. probability upscaling
  3. all the rest : clustering, time-lagged ensemble probabilities, neighbourhood probabilities, ...

## Post-processing priorities for COSMO-E and COSMO-1

1. MOS, specially for T2m and Td2m, if possible not restricted to measurement stations (gridding)
2. Kalman Filter
3. Reforecasts



# Visualisation

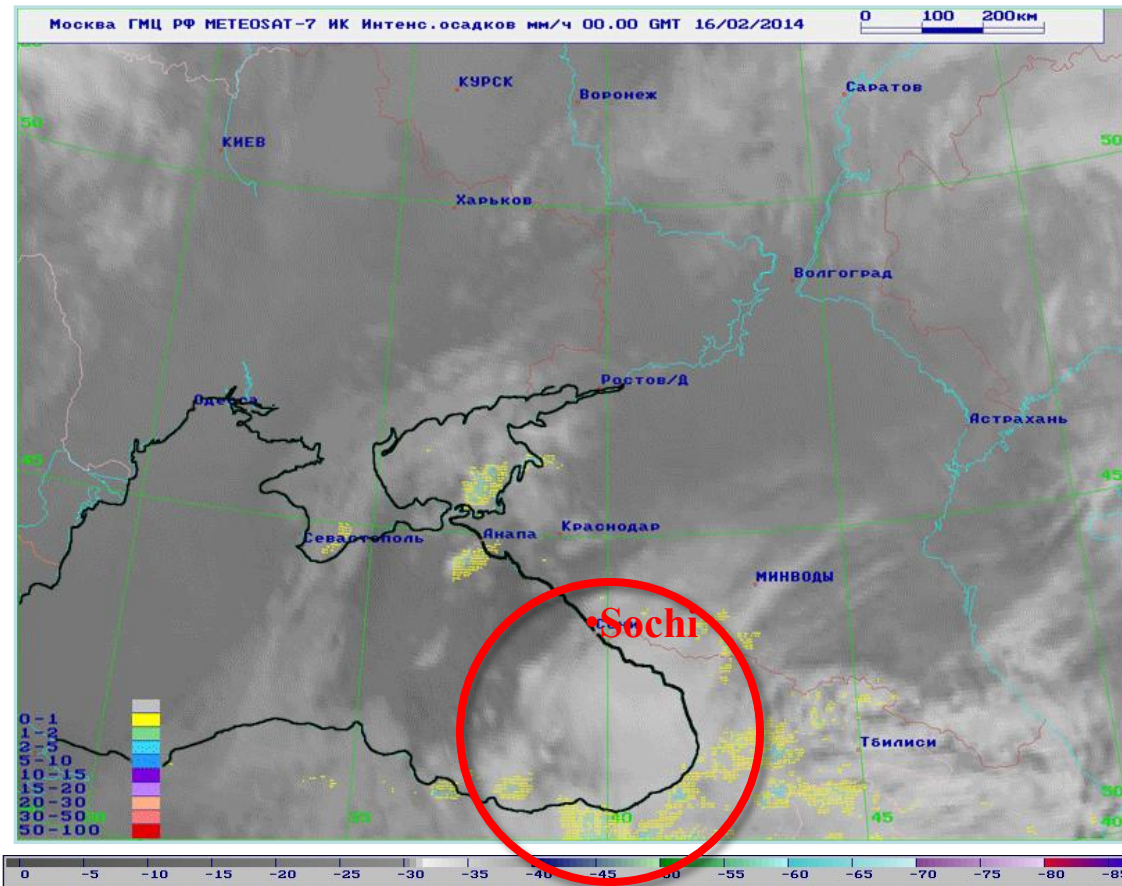


- One can visualise the «best» quantities defined before.
- But the forecaster also needs to understand the model output.
  - Display instability index even if not (well) verified
  - Display combination of parameters: wind and precipitation, wind and humidity,...
  - Display non aggregated values together with original values
  - ...

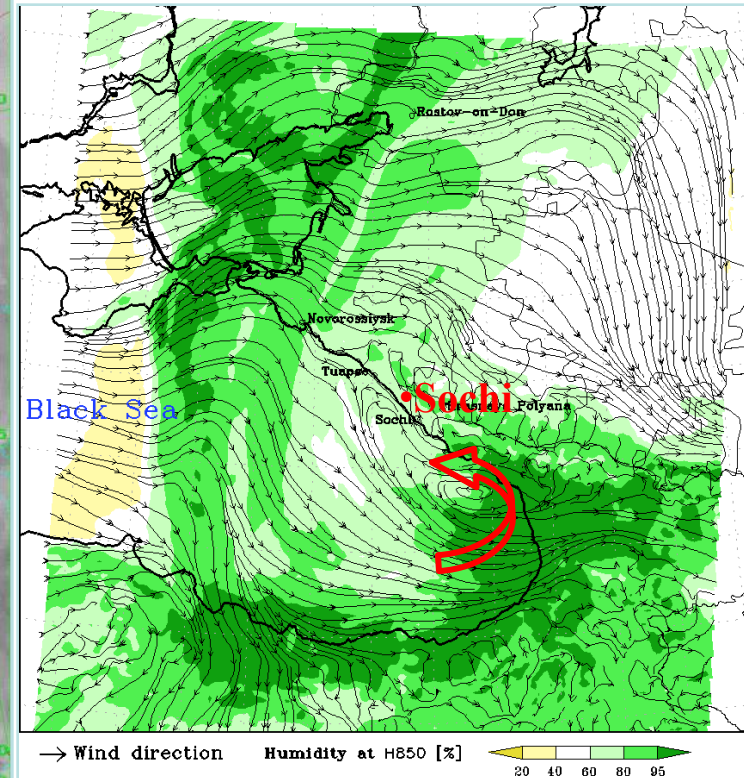


## Low visibility on February, 16-17, 2014

### METEOSAT-7. Cloudiness and precipitation rate 16.02.2014, 00-22 UTC



### COSMO-Ru2 forecast Stream lines and relative humidity at 850 hPa 12 h forecast from 16.02.14, 00 UTC



**COSMO-Ru2 forecast shows  
movement of humid air towards  
Sochi region along the coastline**

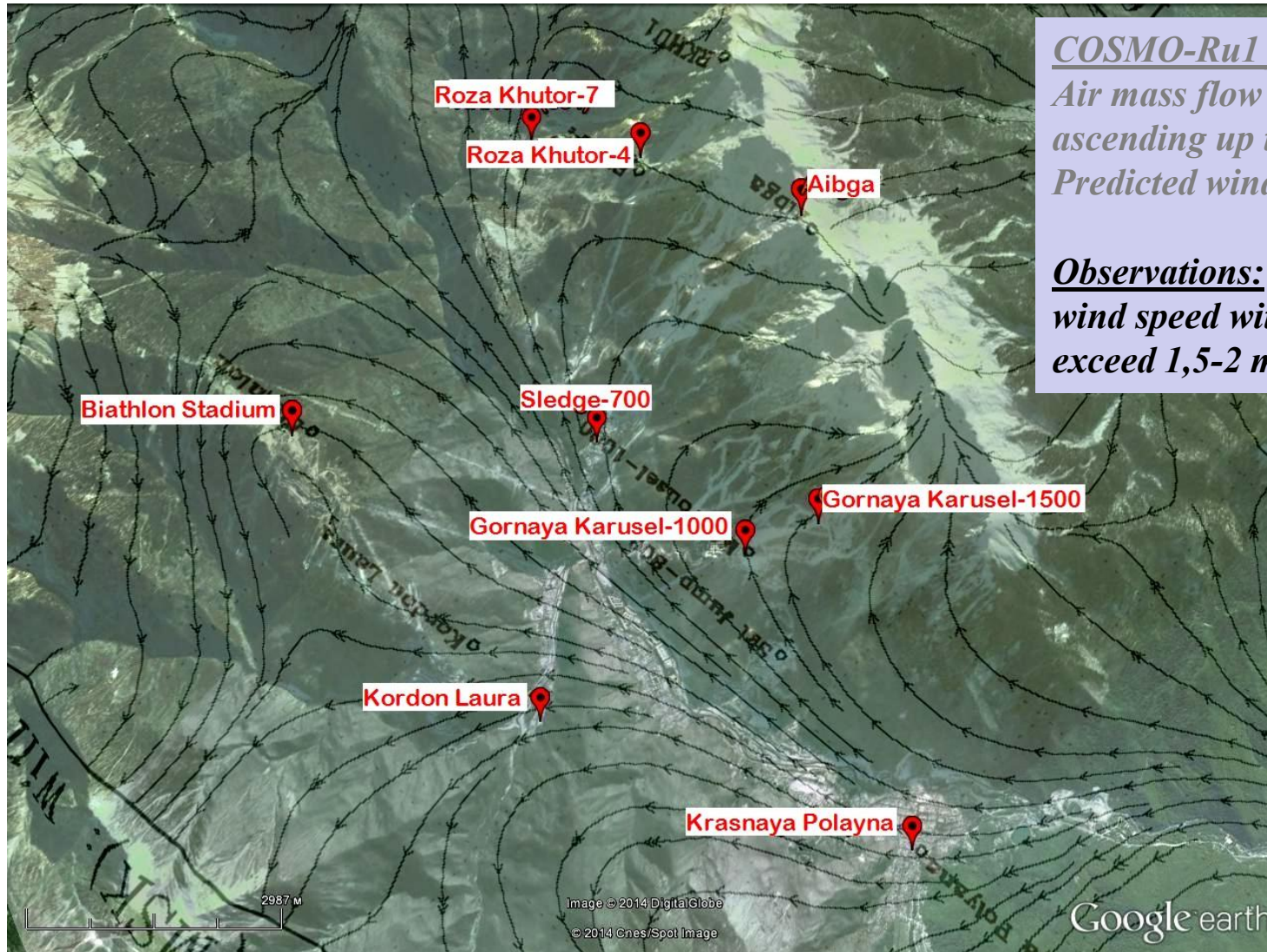




## Low visibility on February, 16-17, 2014



*COSMO-Ru1 wind 13 h forecast from 16.02.2014, 00 UTC for mountain cluster*



### COSMO-Ru1 forecast:

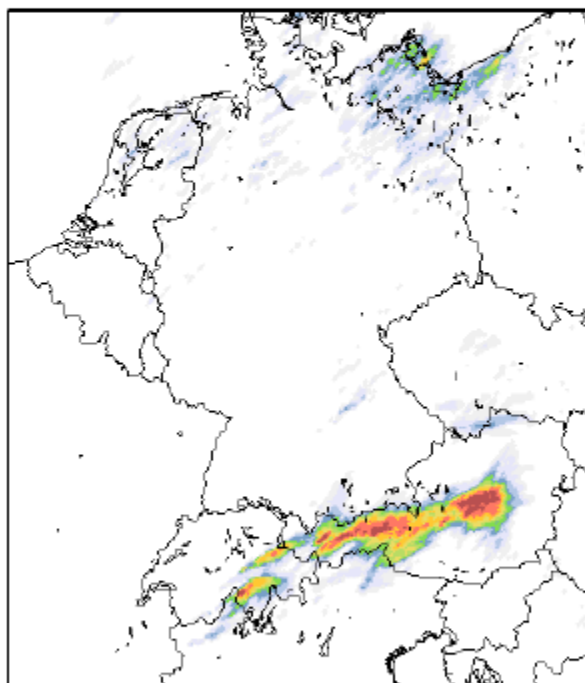
*Air mass flow into the valley  
ascending up the slopes.  
Predicted wind speed – 0.5-2 m/s.*

### Observations:

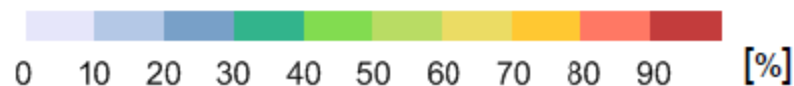
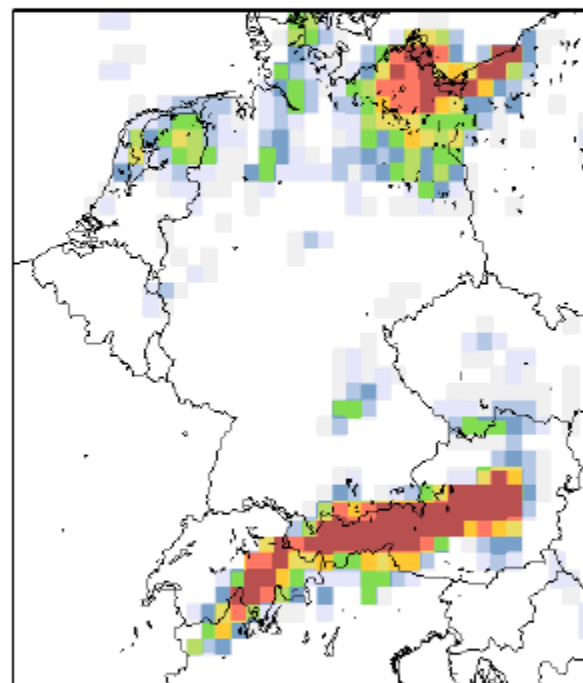
*wind speed within the valley does not  
exceed 1,5-2 m/s.*

Date : August 4, 2012, valid at 18UTC Threshold : 10mm/6h

Prob. forecast at 2.8km



Prob. forecast at 28km





# Scope of WG4



- Explore further the principles exposed before, with verification and ensemble groups.
- Promote exchange of postprocessing methods
- Use of environmental variables
- (renewable) energy

## Σας ευχαριστώ