NWCSAF MSG precipitation products and their applications

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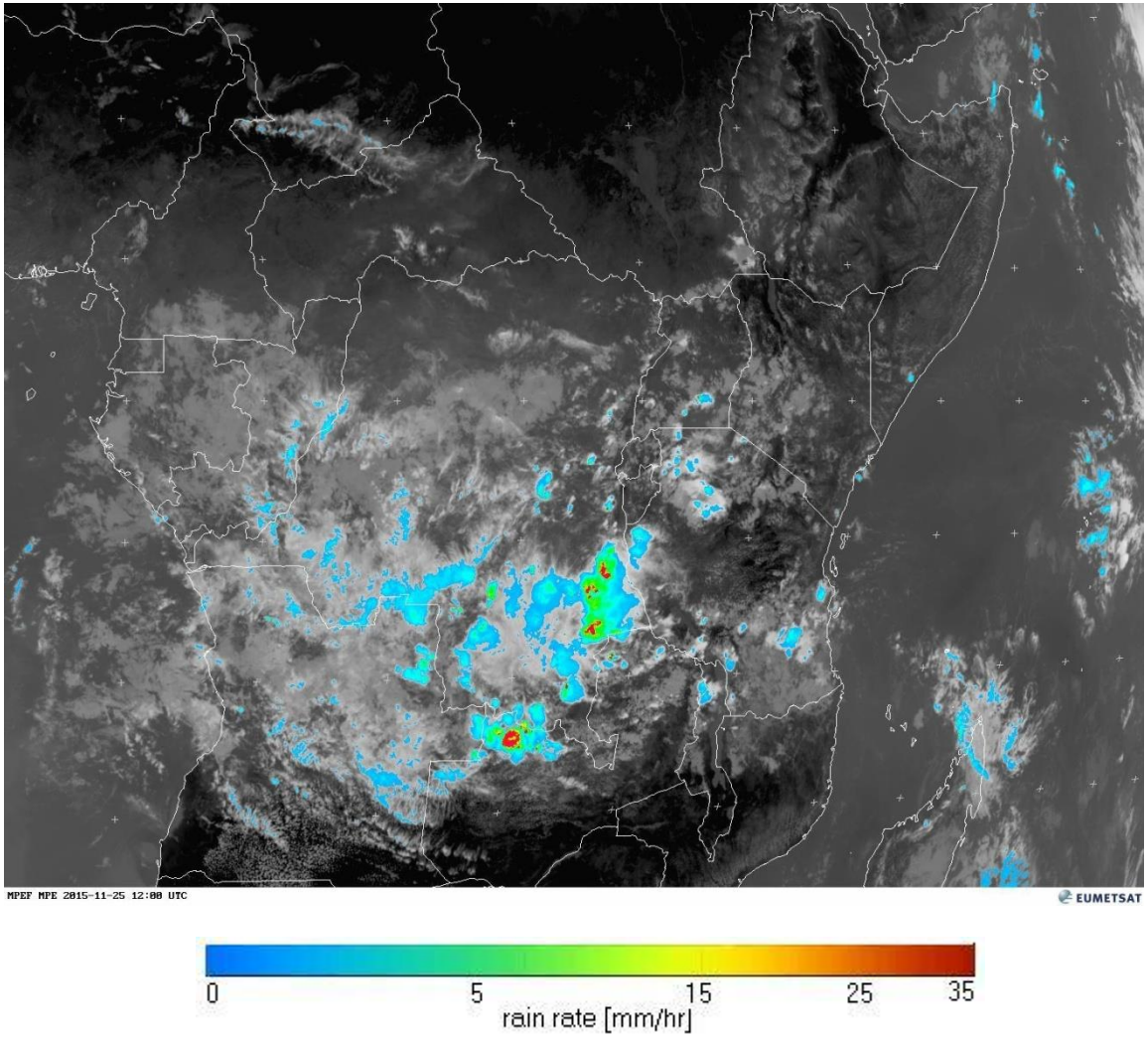
DHMZ

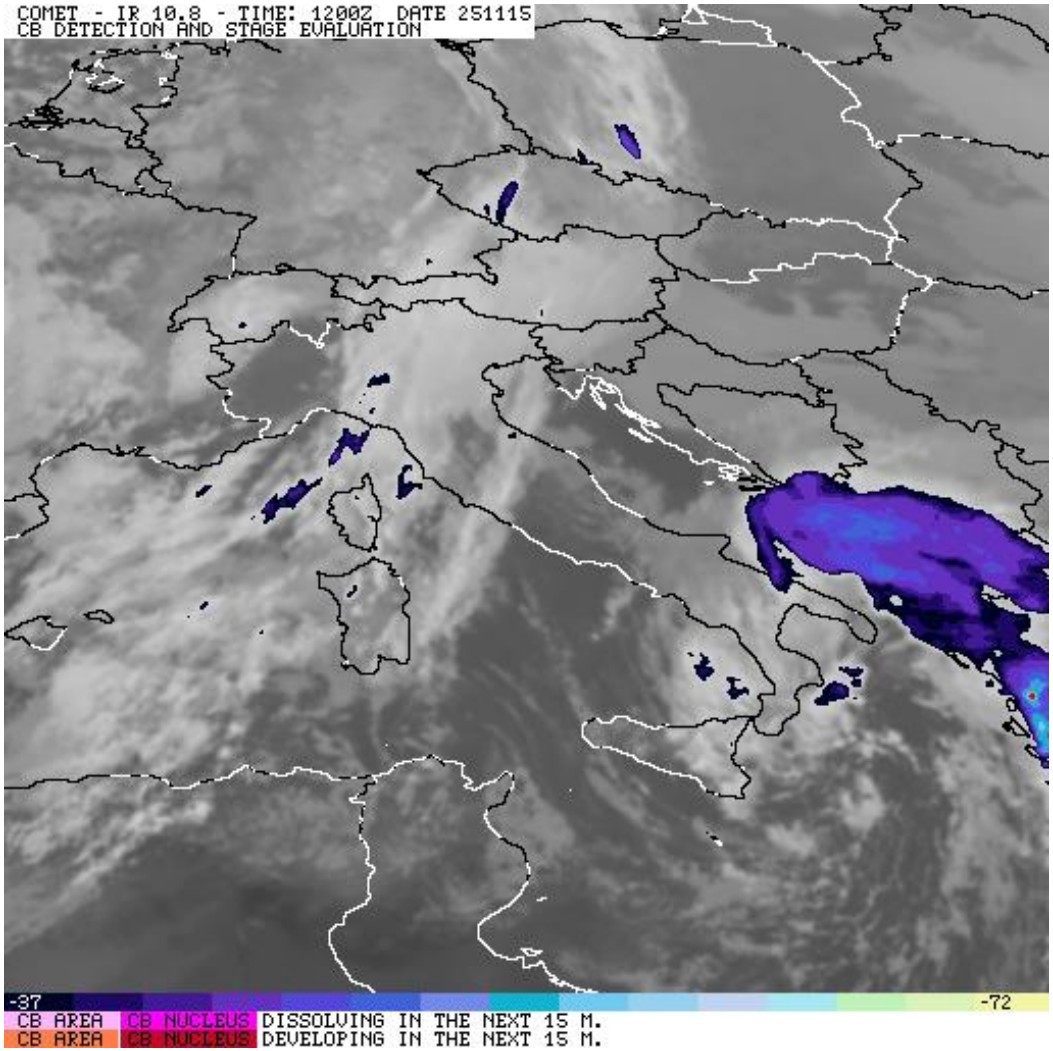
Satelite precipitation



The Multi-Sensor Precipitation Estimate (MPE) product consists of the near-real-time rain rates in mm/hr for each Meteosat image in original pixel resolution. The algorithm is based on the combination of polar orbiter microwave measurements and images in the Meteosat IR channel by a so-called blending technique. The MPE is most suitable for convective precipitation. Applications and Users: Operational weather forecasting in areas with poor or no radar coverage, especially in Africa and Asia.

More at: http://oiswww.eumetsat.org/IPPS/html/MSG/PRODUCTS/MPE/index.htm

Satelite precipitation

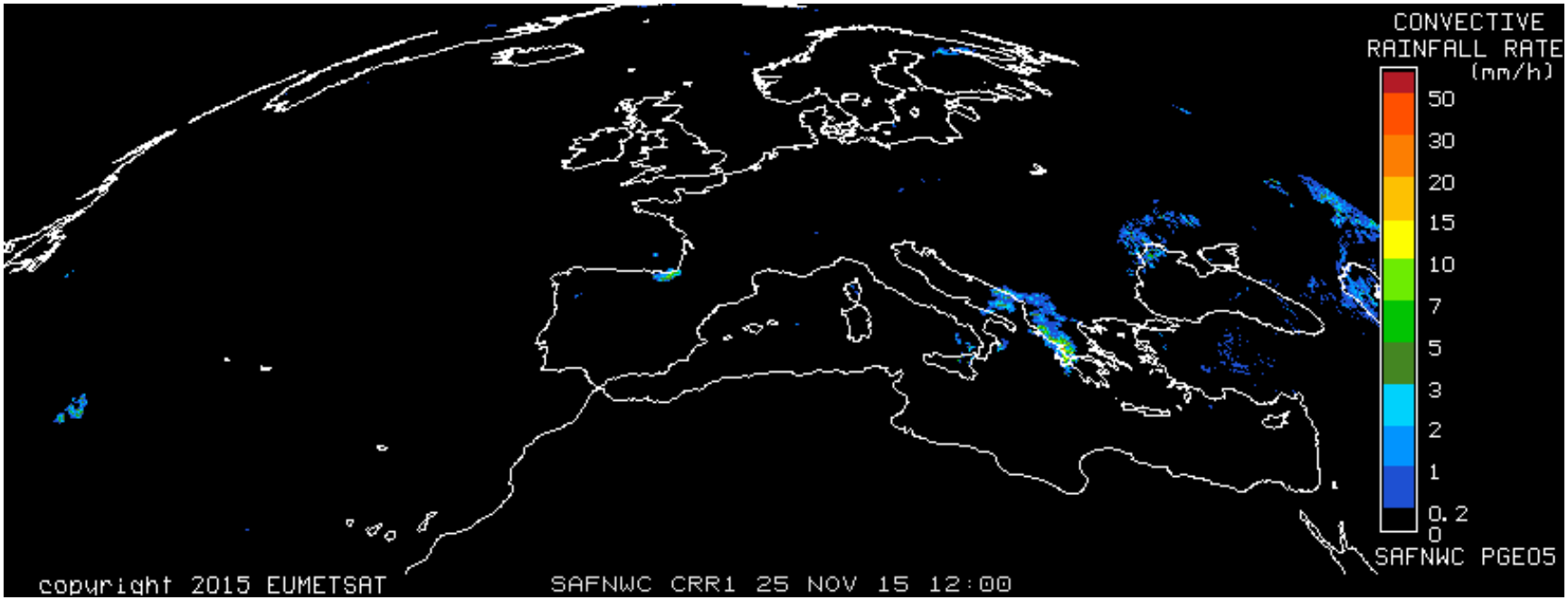


NEFODINA is an algorithm to assess the presence of storms and their intensity using data from geostationary satellites. Provides information on nuclei convective cloud systems within a multi-channel approach

Translate CB intensity to precipitation estimate.

More at: http://www.meteoam.it/help_nefodina

Satelite precipitation



The objective of the CRR product is to estimate the precipitation rate associated to convective clouds. This product provides to forecasters complementary information to other NWC SAF products related to rain and convection monitoring as PGE04 (Precipitating clouds) and PGE02 (Cloud type).

More at: http://www.nwcsaf.org/HD/MainNS.jsp

Satelite precipitation – general idea!

Translate information from meteorological satellite (radiances or reflectances) of to a precipitation estimation.

Do a calibration of channels combinations with some “measured” precipitation.

Use a calibration results for the precipitation estimations.

(Use whatever else you can to get a better estimations!)

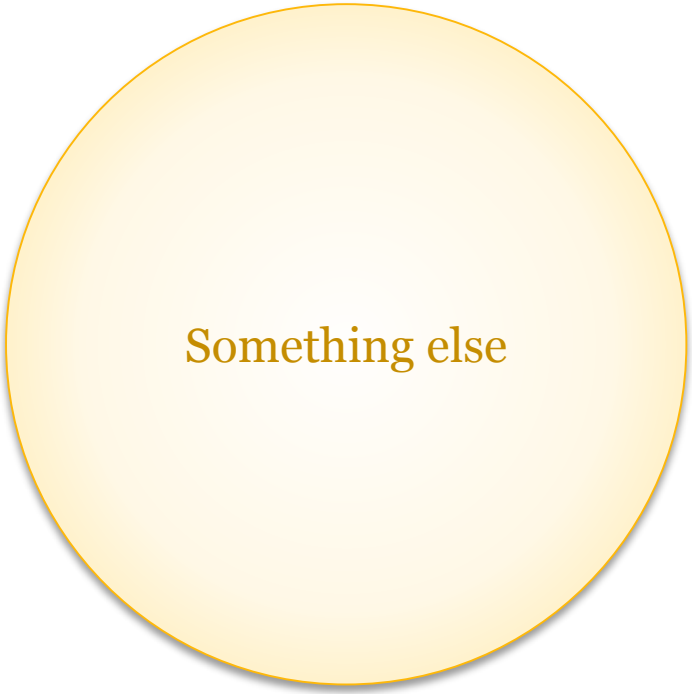
Be aware!

Understand the product!

Know its limitations!

Quis time

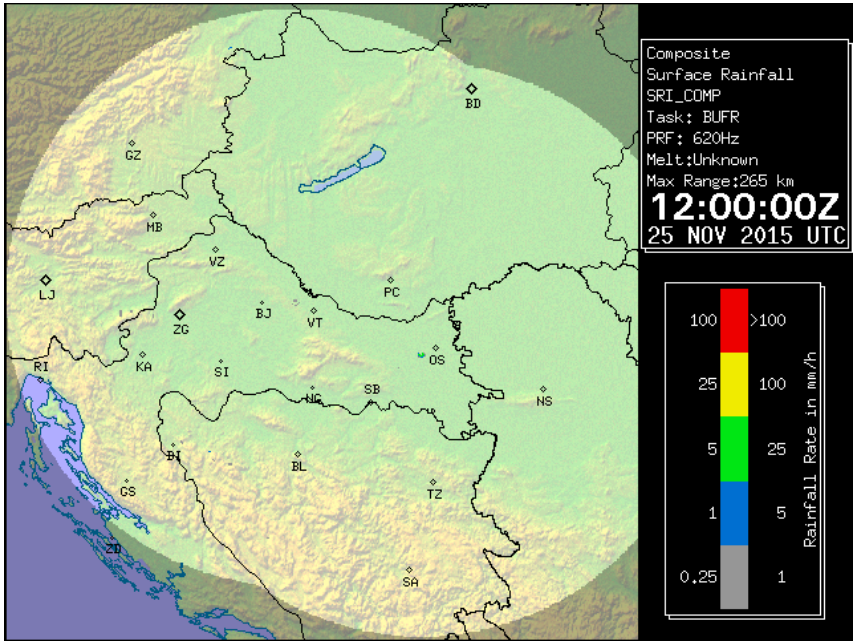

Forecaster

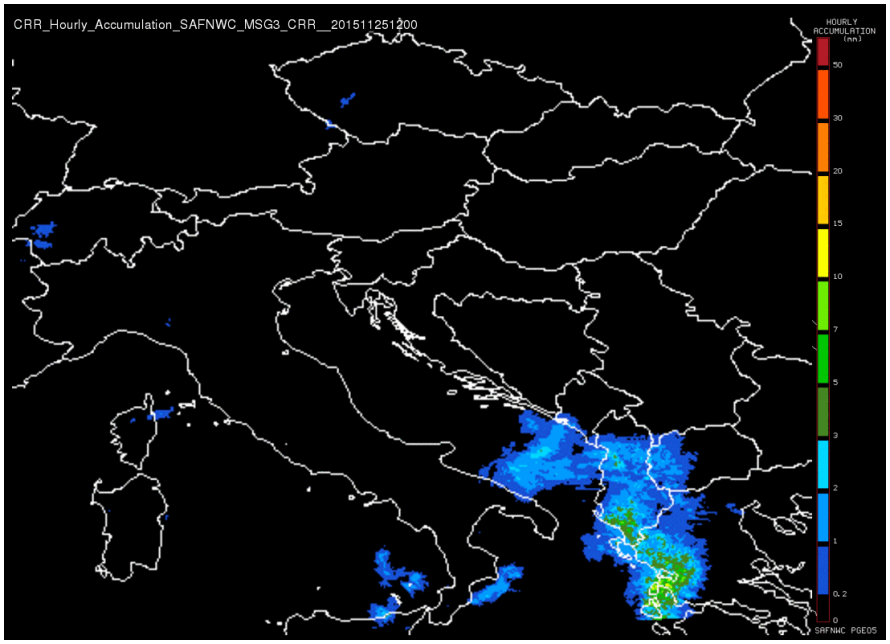

Something else

Q: Imagine you are a forecaster and you are working in the middle of July. In forecasting environment, if you have to choose only one product for precipitation analysis, what would it be?

Radar composite image

Satellite precipitation product



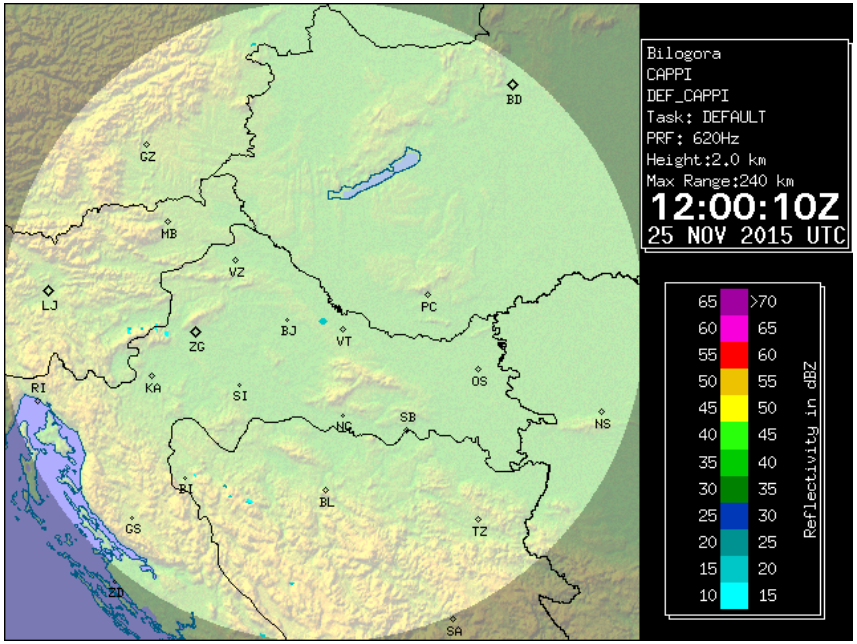


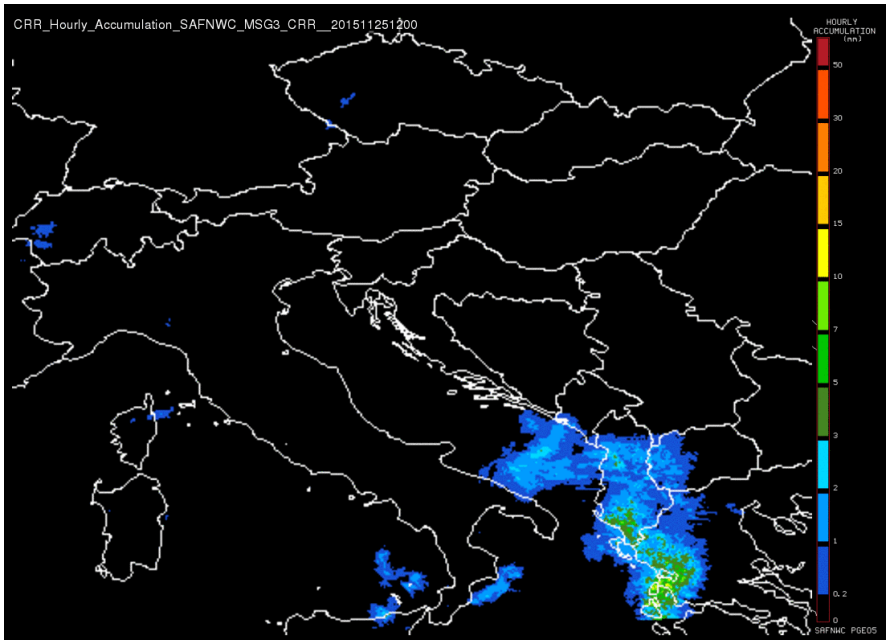
Put a star on your choice. .

Q2: Imagine you are a forecaster and you are working in the middle of July. In forecasting environment, if you have to choose only one product for precipitation analysis, what would it be?

Only one radar

Satellite precipitation product





Put a star on your choice. .

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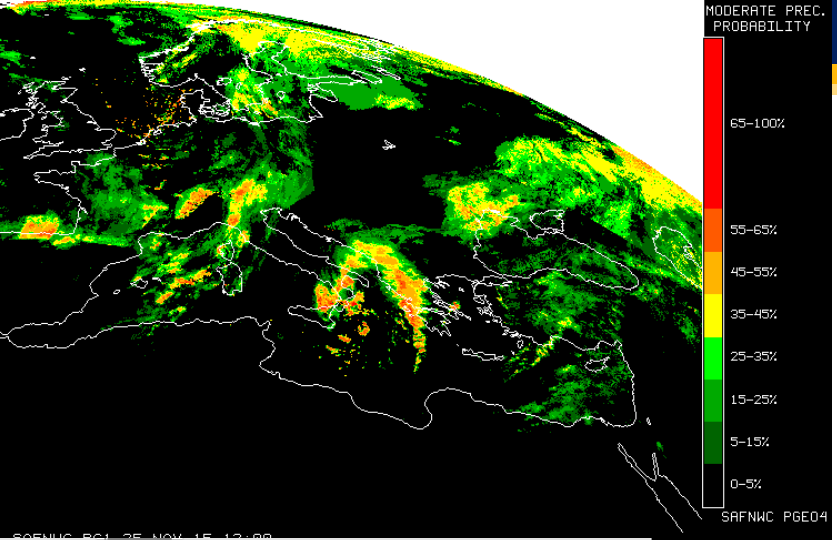
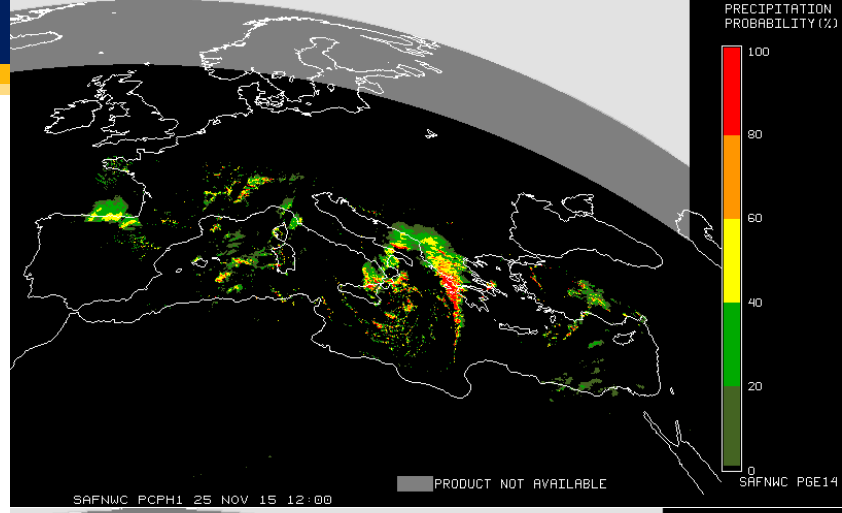
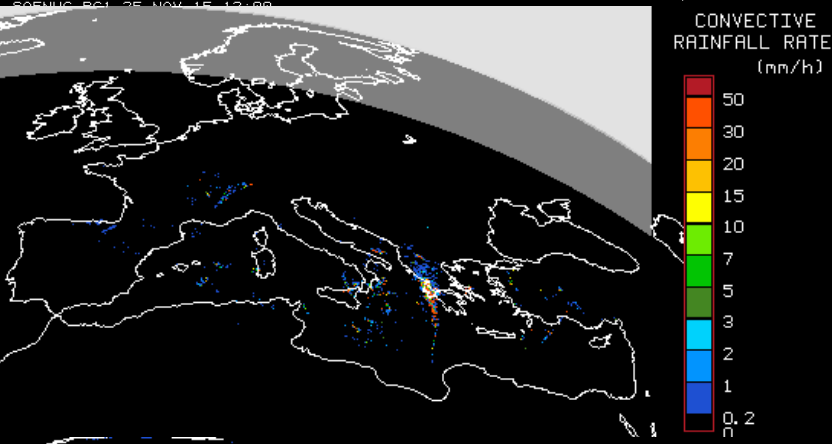
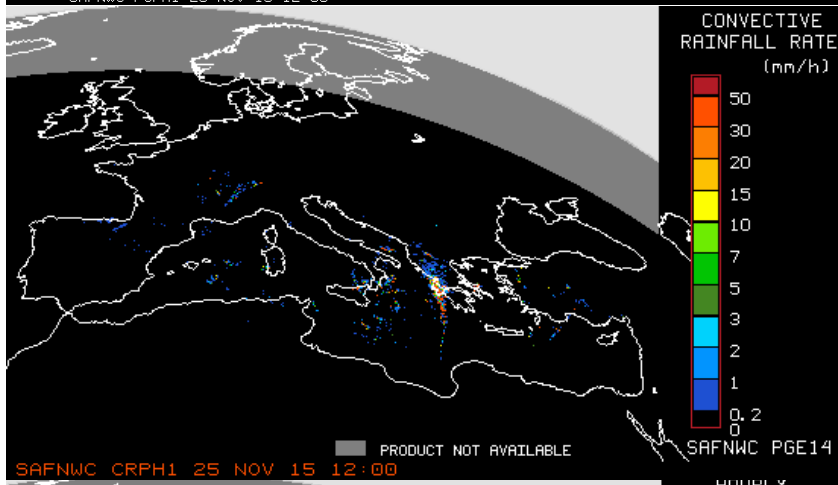
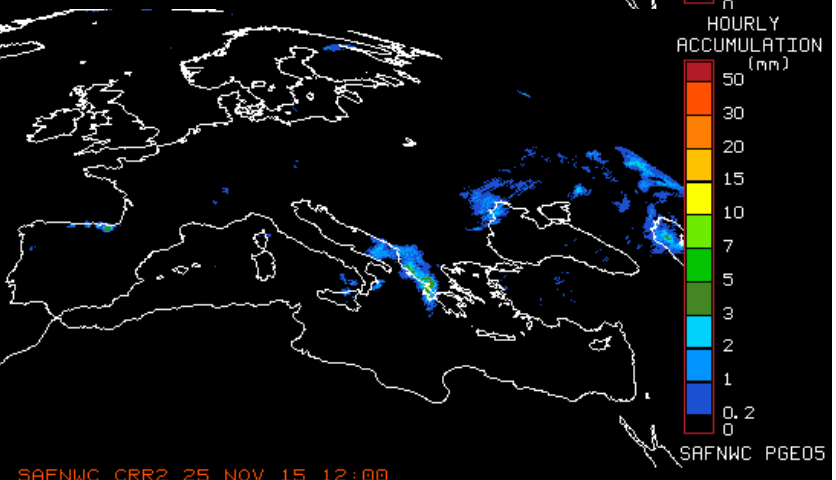
Day time only

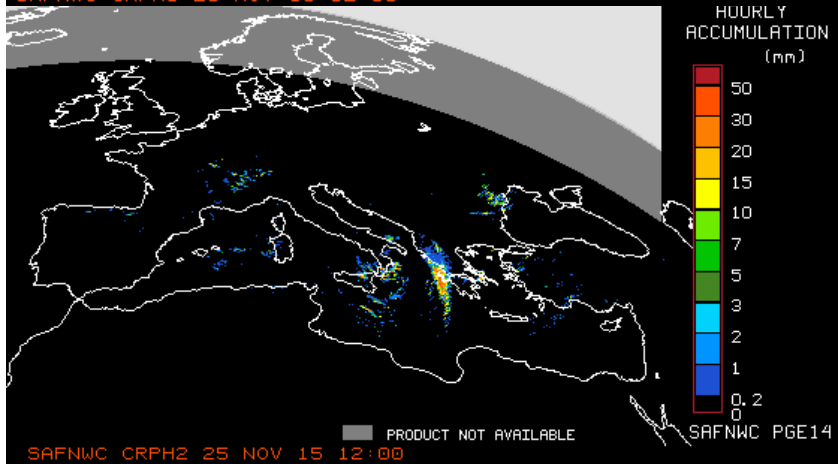


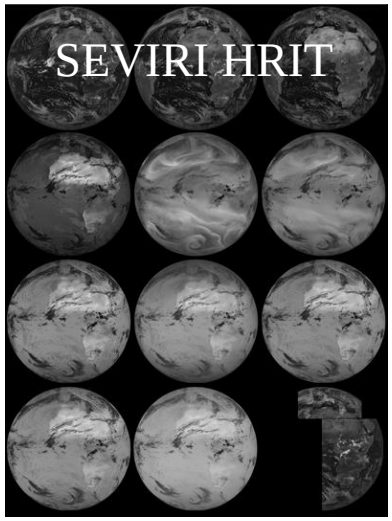










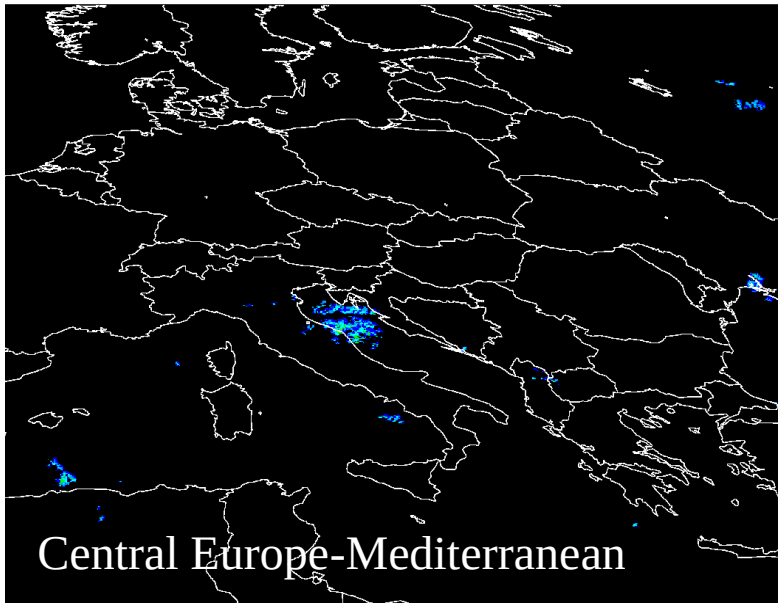


ALADIN ASSIM

ECMWF
EUROPEAN CENTRE FOR MEDIUM RANGE WEATHER FORECASTS

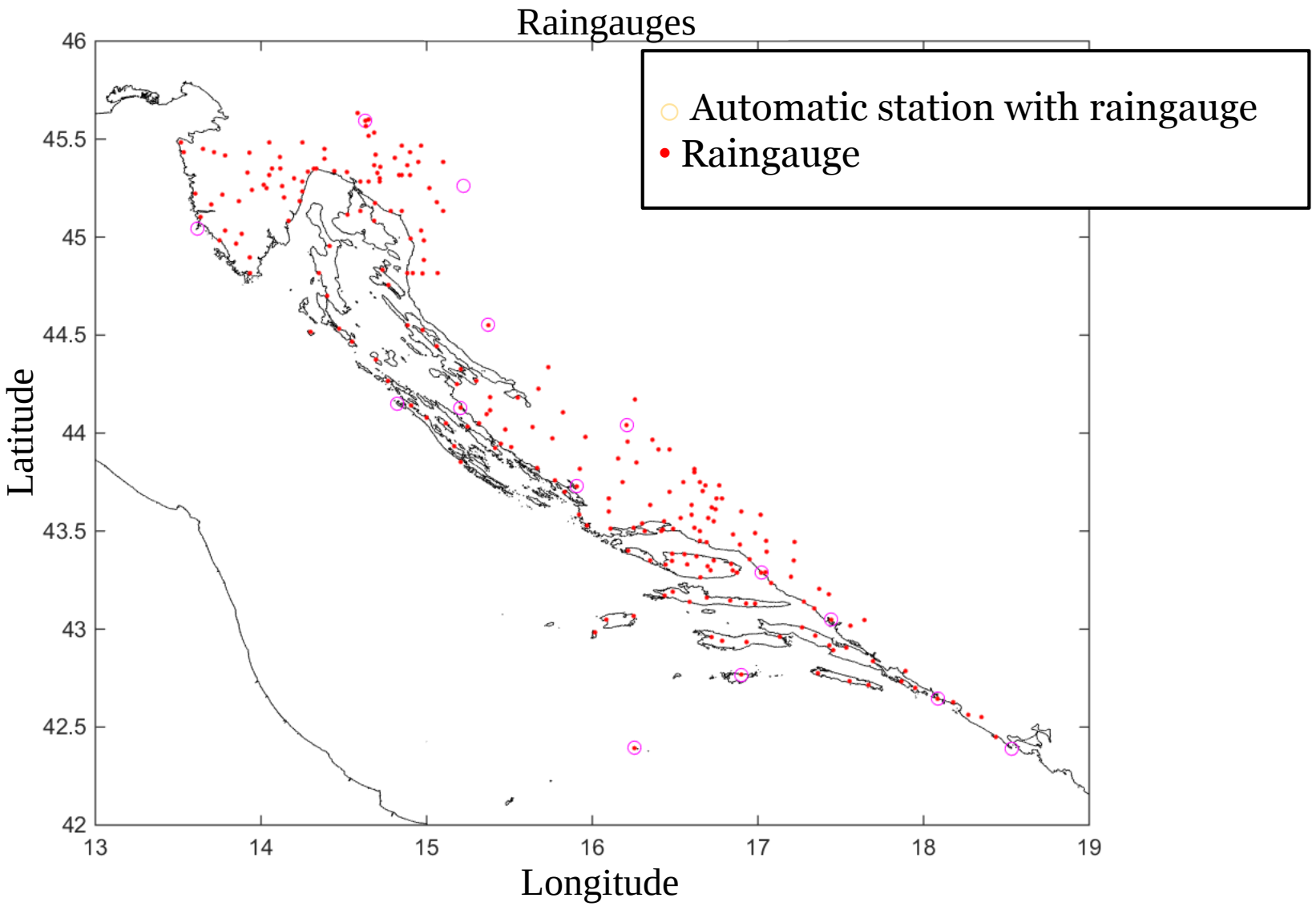
OBSERVATION

NWCSAF
MSG

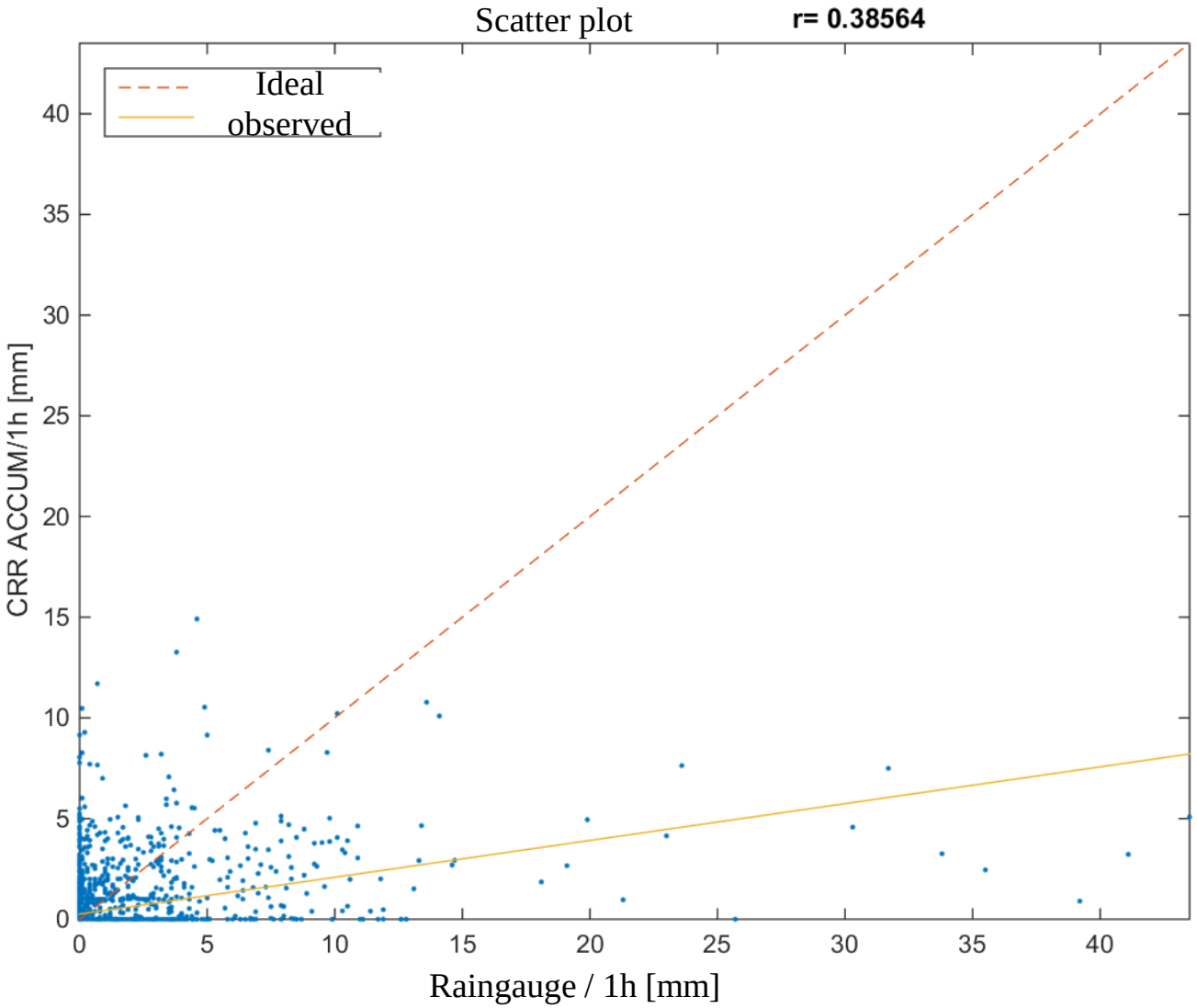


Comparison CRR vs. raingauges

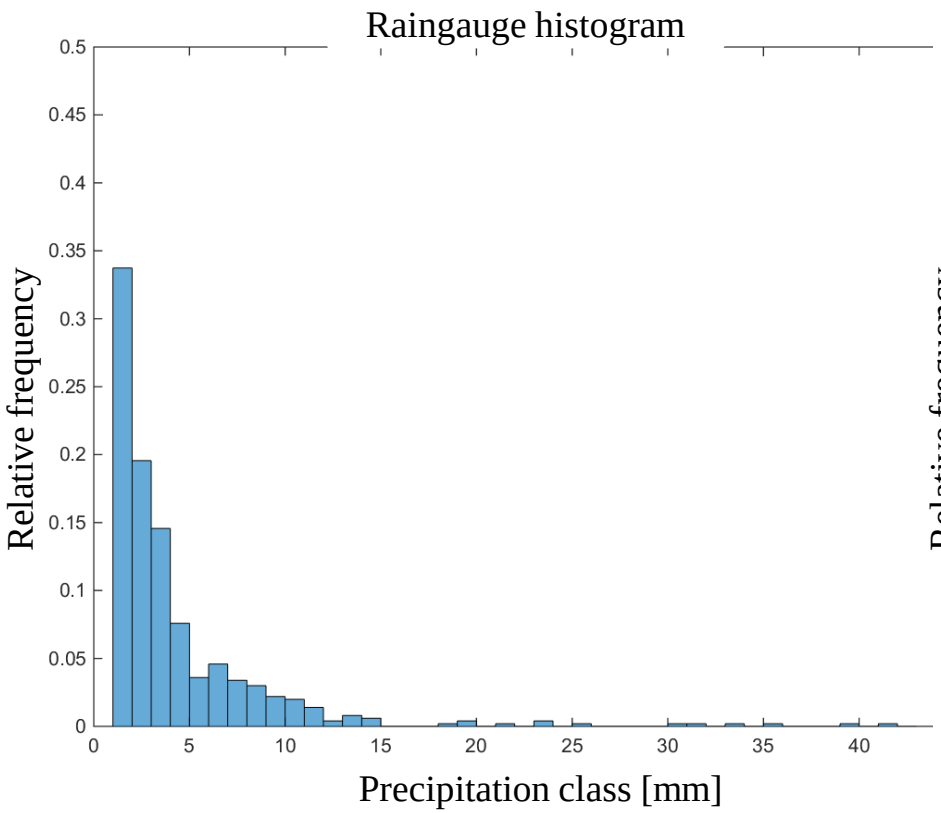
- HyMeX-SOP1
  - Hydrological cycle in the Mediterranean EXperiment
  - From 5 September to 6 November 2012
    - 12. 9. – 14. 9.
    - 19. 9. – 20. 9.
    - 1.10. – 2. 10.
    - 15. 10. – 16. 10.
    - 26. 10. – 29. 10.
    - 31.10. – 01. 11.

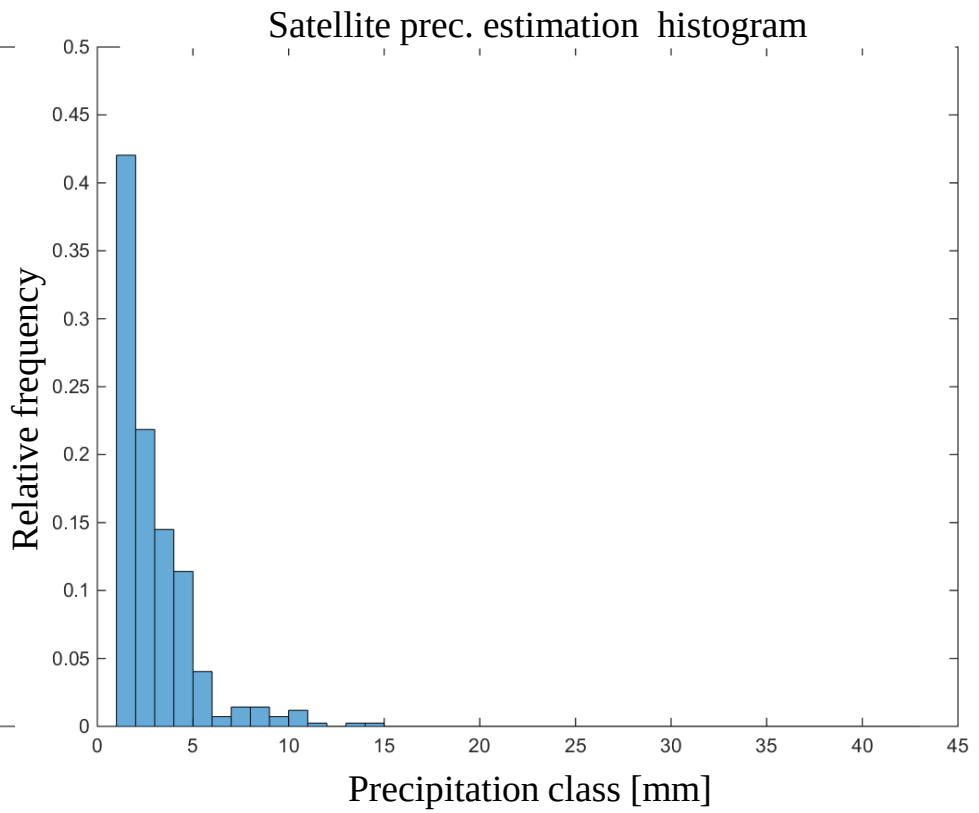

Raingauges
Automatic station with raingauge
Raingauge
Latitude
Longitude
46
45.5
45
44.5
44
43.5
43
42.5
42
13
14
15
16
17
18
19

Hourly accumulation

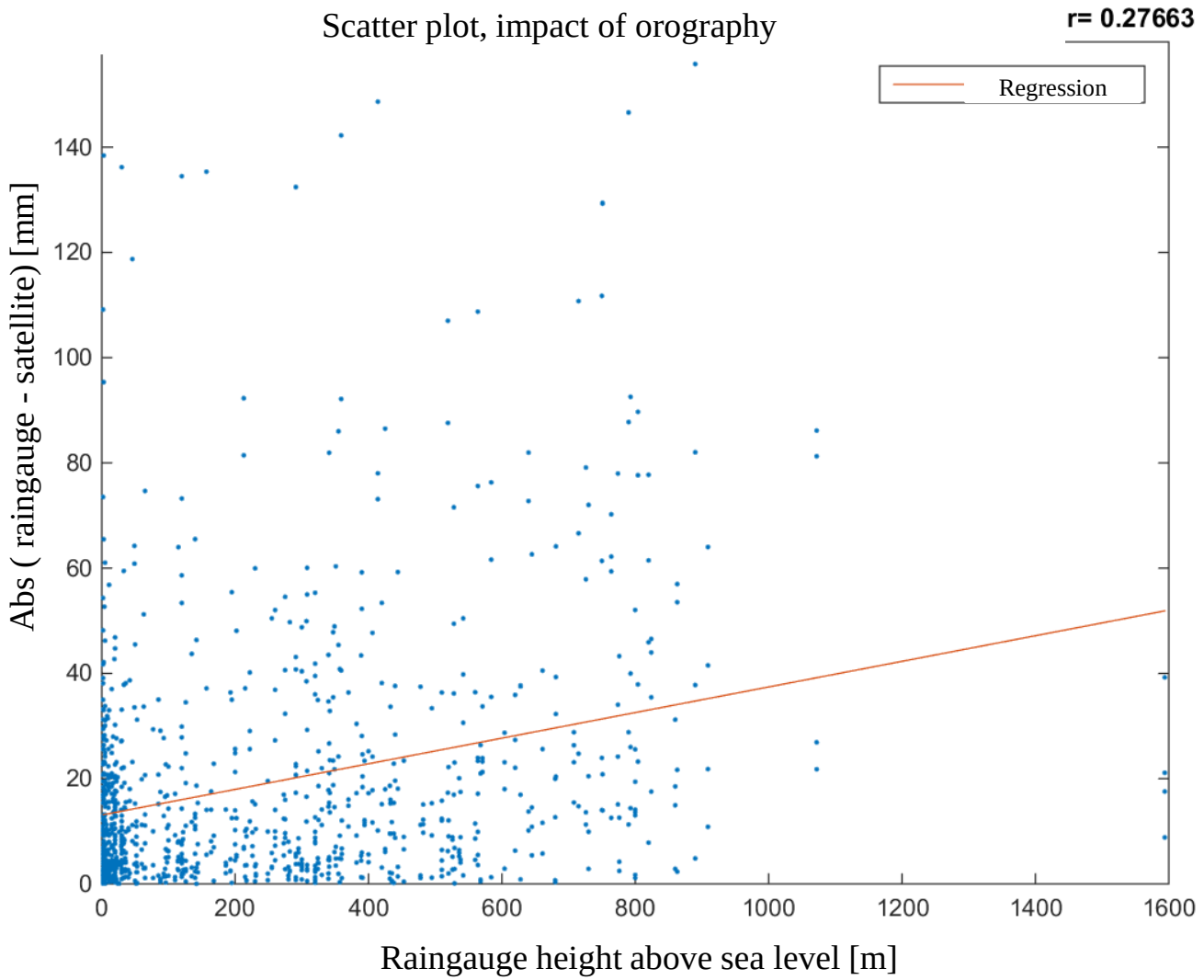


Hourly accumulation





Orography


Scatter plot, impact of orography
r= 0.27663
Regression
Abs (raingauge - satellite) [mm]
0
20
40
60
80
100
120
140
0
200
400
600
800
1000
1200
1400
1600
Raingauge height above sea level [m]

ECMWF
EUROPEAN CENTRE FOR MEDIUM RANGE WEATHER FORECASTS

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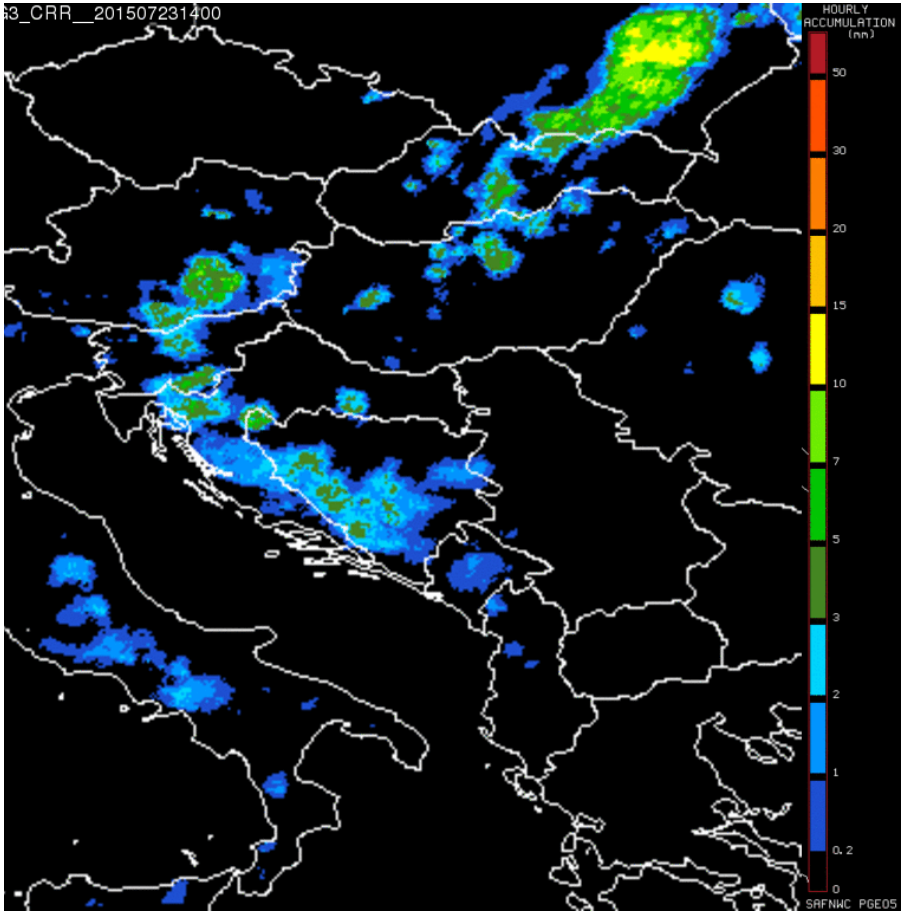

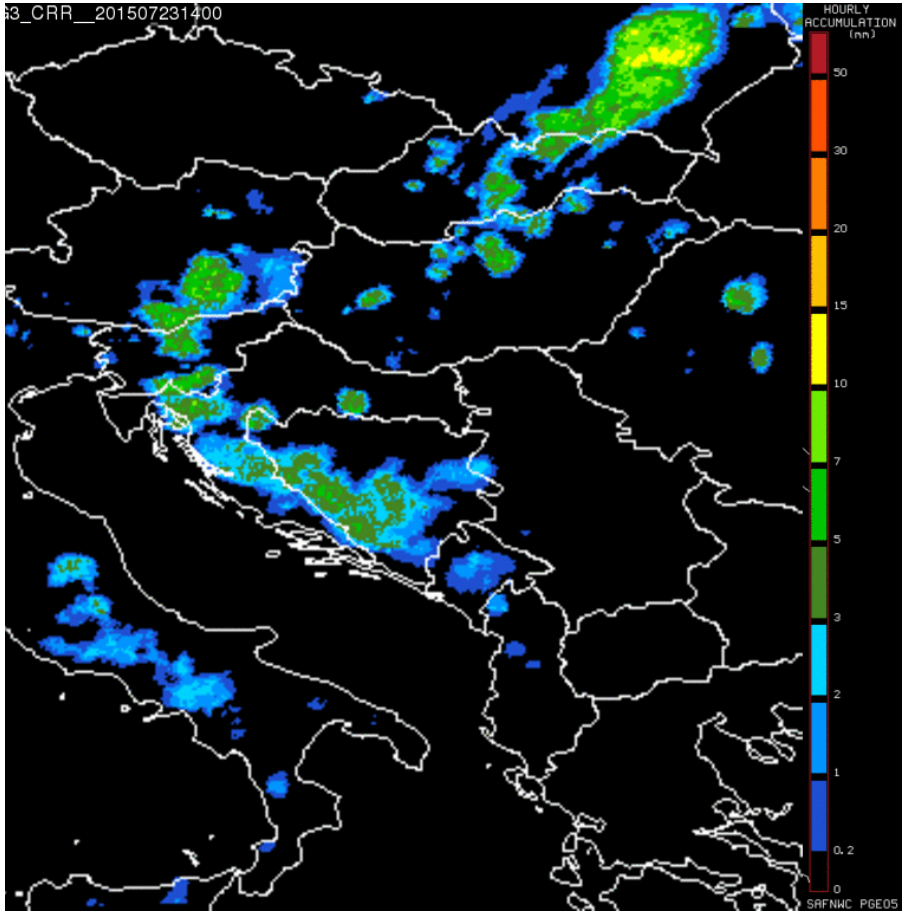

23 July 2015, 14:00 UTC PGE5 CRR hourly accumulation

ECMWF
EUROPEAN CENTRE FOR MEDIUM RANGE WEATHER FORECASTS

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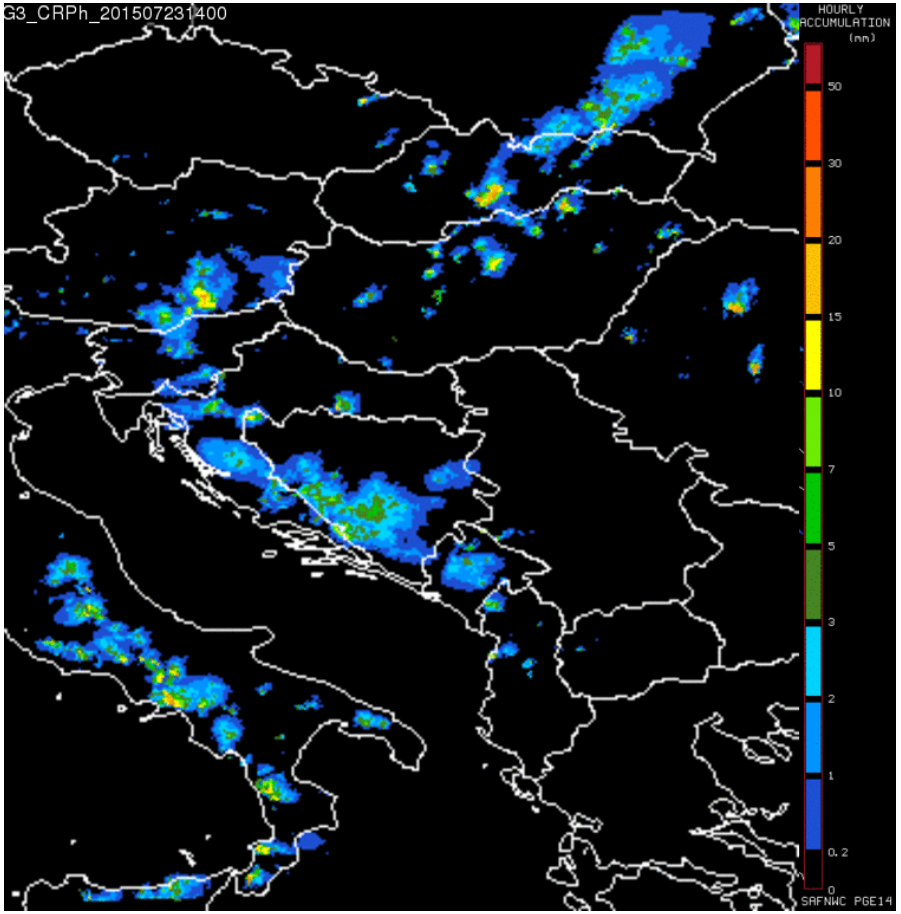

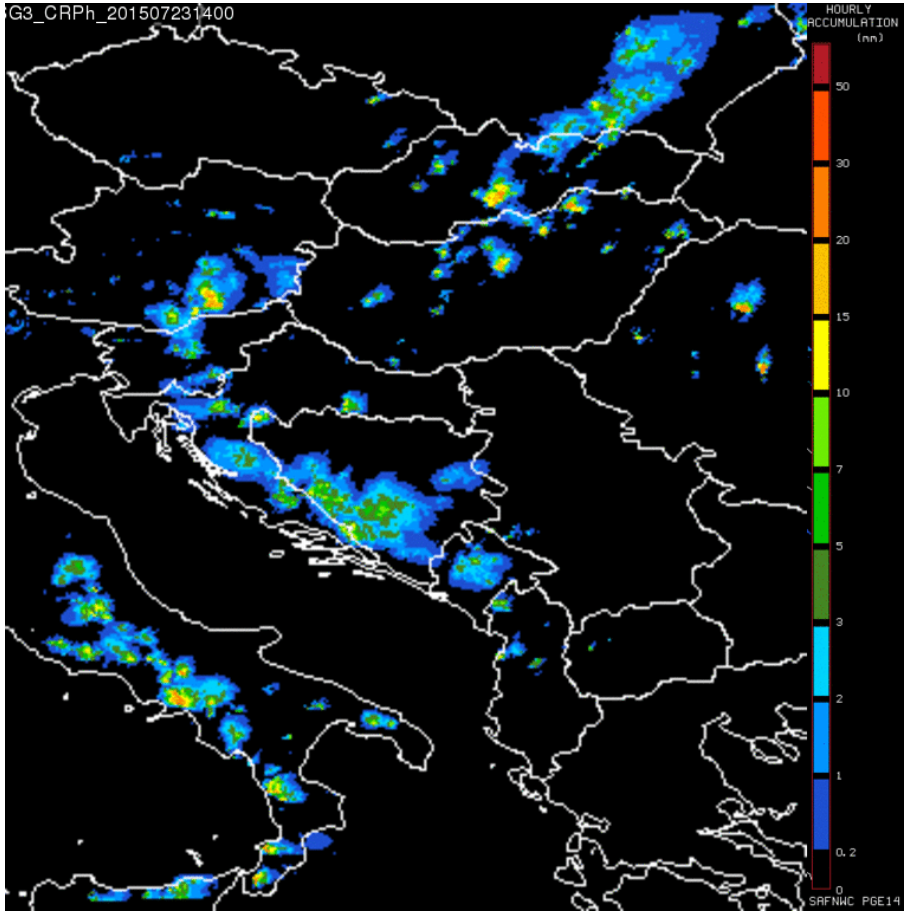

23 July 2015, 14:00 UTC PGE14 CRR hourly accumulation

Conclusion

- ALADIN and ECMWF model produce similar CRR values
- Using regional model with higher spatial resolution (8 km) produces slightly higher precipitation
- Both PGE05 and PGE14 underestimate precipitation
- PGE14 (available during daytime) CRR is closer to radar precipitation rates

Thank you!