Koninklijk Nederlands
Meteorologisch Instituut
Ministerie van Infrastructuur en Milieu

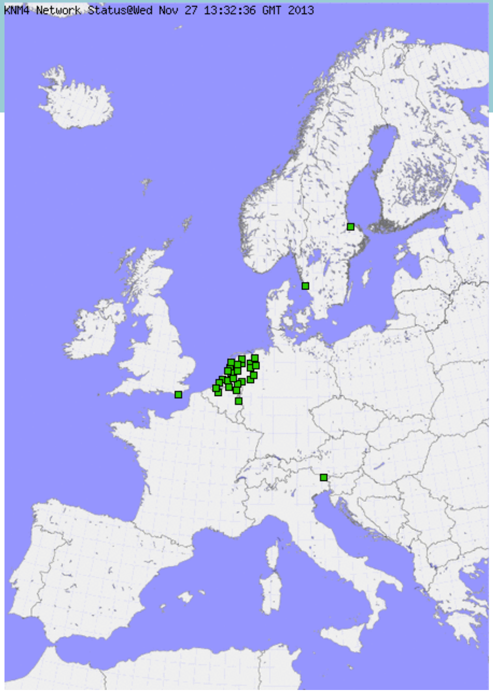
Processing and usage of GNSS

Siebren de Haan

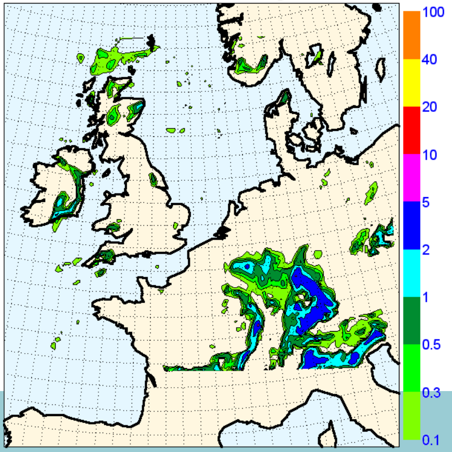
Real Time

Hourly

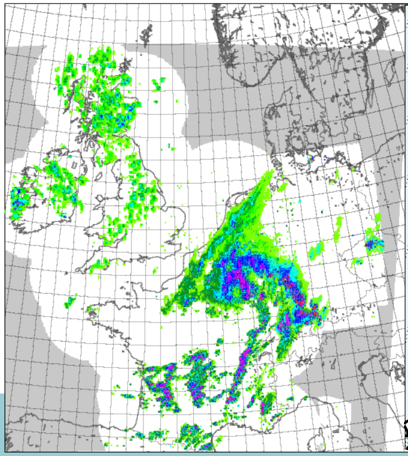
- Processing within 10 min.
- Dutch regional network + NTRIP stations
- Assimilated in hourly run of HIRLAM
- Positive impact on rainfall



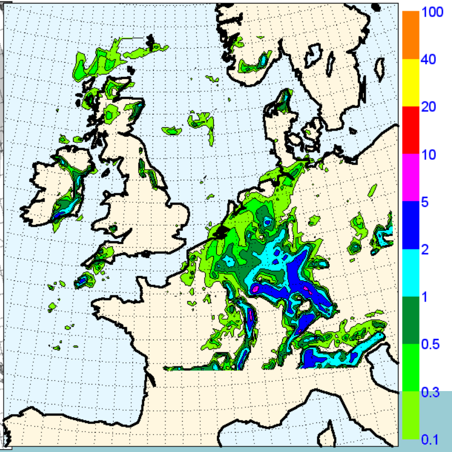
U11 t+1 precipitation forecast valid:
16 to 17 UTC on 11 May 2010



radar uursom 2010051117



U11gps t+1 precipitation forecast valid:
16 to 17 UTC on 11 May 2010

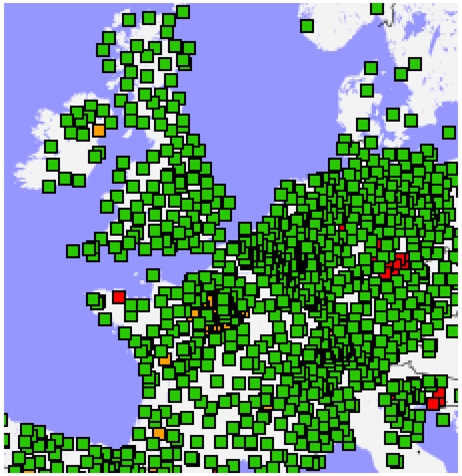


Next in 2014/5

Assimilation in Harmonie

Every 3 hours:

- VARBC
- All centres
  - Cut-off time 1h10m



Hourly….?

- Slant delay?
  - Processing : PPP?

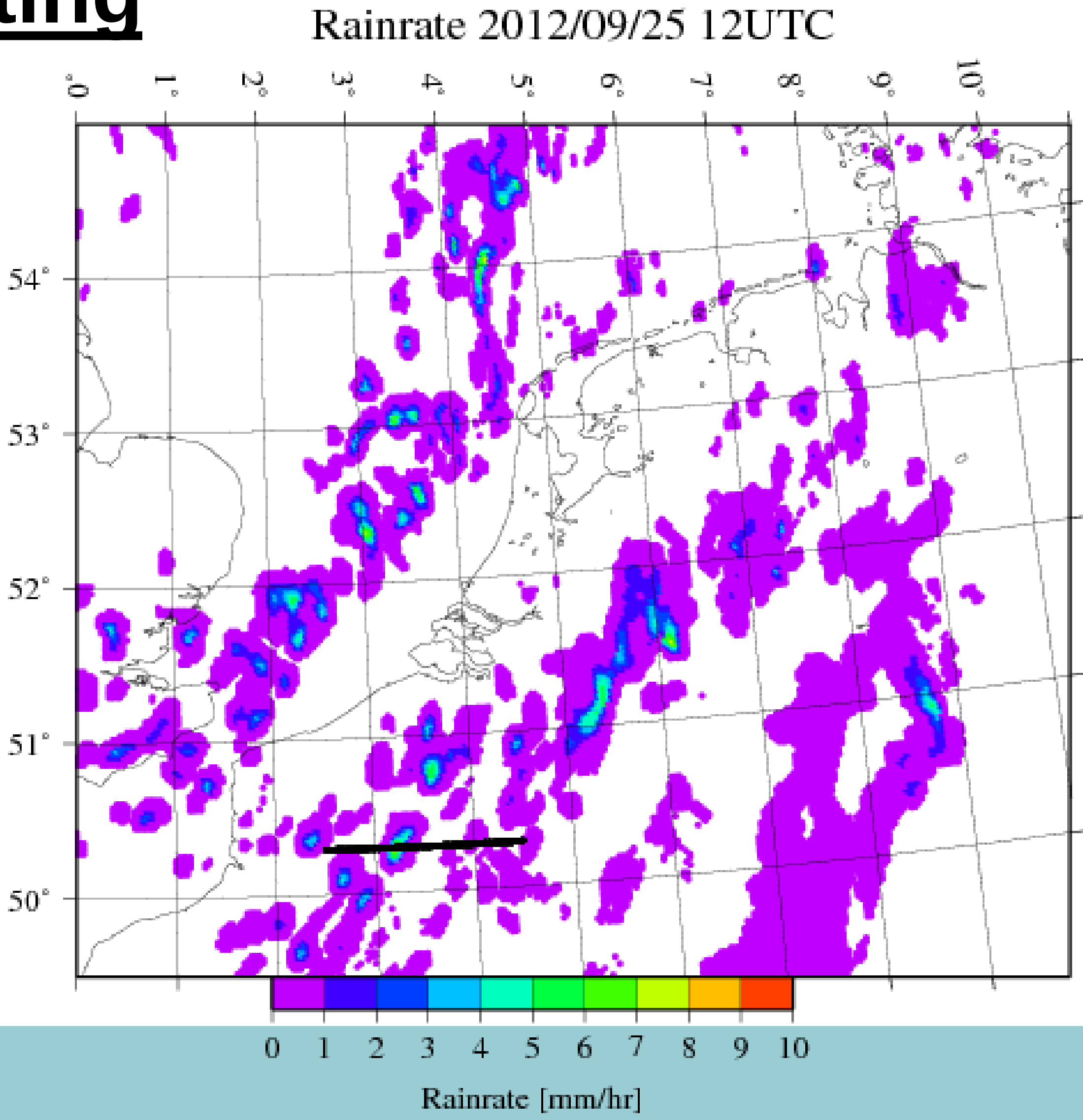
Slants and nowcasting

A good case says more than ……

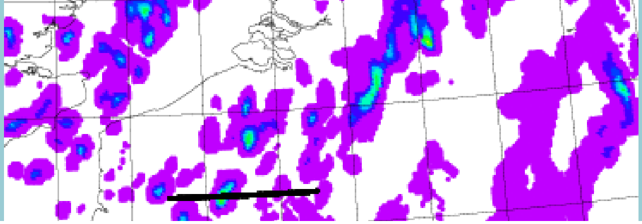
Harmonie run

- 2.5 km
- Non-hydrostatic
- 12 hour forecast

Severe very local convective rainfall



ΔSlant Wet Delay information (v0)

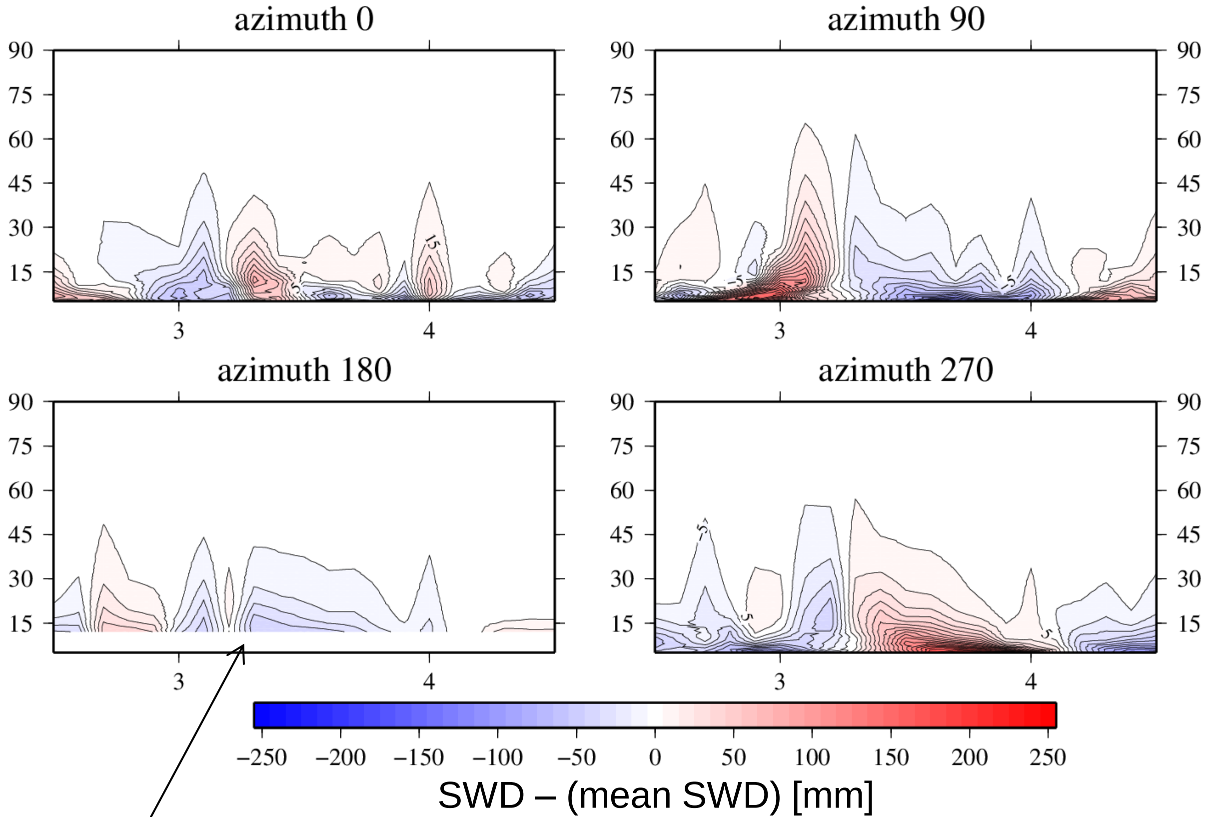


Algorithm developed for HIRLAM 11km (hydrostatic)!!

Mean SWD ≈ ZTD/mapping

There is a signal!

Very high density network needed



southern model boundary

Mean of SWD over all azimuth at given elevation