OPERA – the operational weather radars in Europe

November 2013

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Opera in brief

- Radar project of European NMS's within EUMETNET
- Objectives:
- to provide a European platform wherein expertise on operationally-oriented weather radar issues is exchanged.
- to develop, generate and distribute high-quality pan-European weather radar composite products on an operational basis

Opera The Club

- 30-40 European experts
- 2 x year since 1999
- Open discussion of local and common challenges, experience, outlooks
- Joint projects producing reports and software

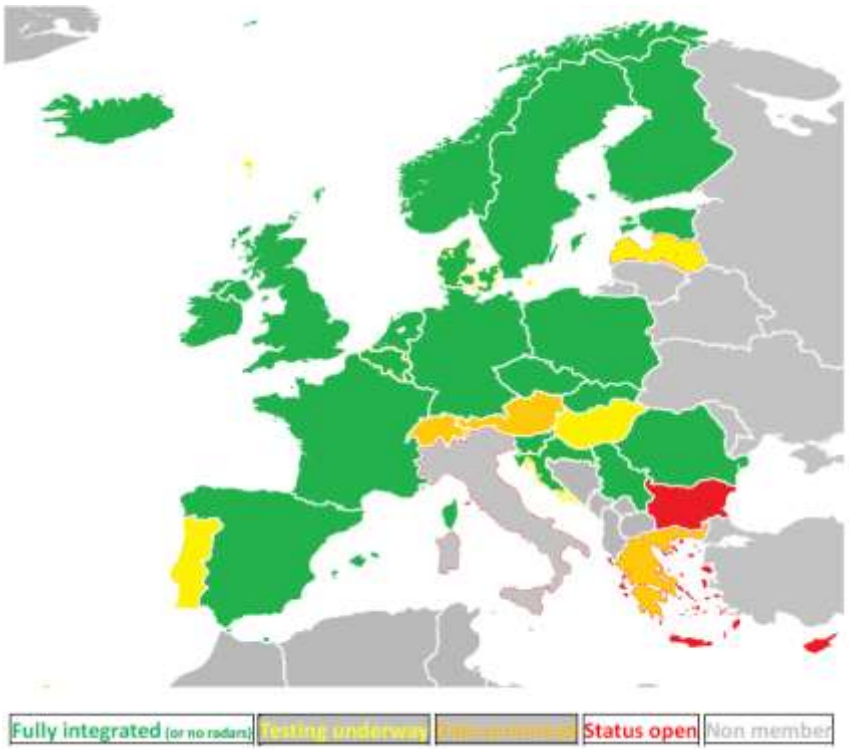
OPERA has credibility

- OPERA has prepared statements of wind farms and radio interference
- OPERA is encouraging manufacturers to support OPERA's requested data formats (BUFR and HDF5)
- OPERA is preparing reviews of new technologies
  - Opera 1 : "How to buy a Doppler radar"
  - Opera 3: "Dual polarization"

Opera Data Centre ODC = ODySsey

- Opera operates and develops the ODYSSEY data hub, which collects radar volume data, distributes quality flagged volume data to modellers and other radar data users, and produces quality controlled radar products;

Odyssey Input June 2013



- Green: sending data
- Yellow: testing
- Orange: data promised
- Grey: not member

Odyssey Output: 3 composites

Surface rain rate composite (every 15 minutes):

Each composite pixel is a weighted average of the lowest valid pixels of the contributing radars, weighted by the inverse of the beam altitude. Polar cells within a search radius of 2.5 km of the composite pixel are considered. Data measured below 200 m altitude are not used.

Rainfall accumulation (every hour),

sum of the previous four 15-minute surface rain rate products.

Maximum reflectivity composite (every 15 minutes)

See next page

Odyssey Output: 3 composites

Maximum reflectivity composite (every 15 minutes):

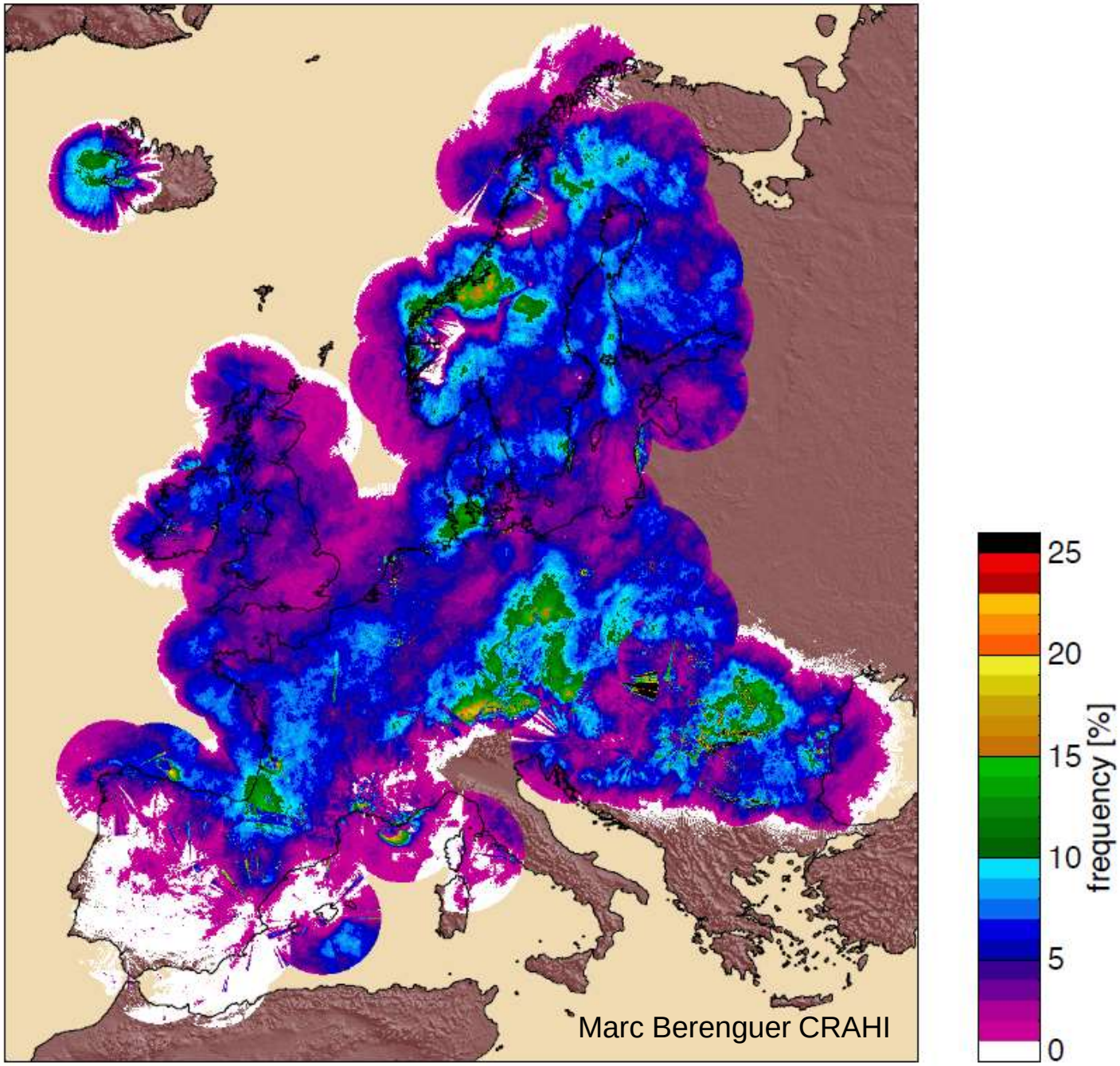
Each composite pixel contains the maximum of all polar cell values of the contributing radars at that location.

How good is it ?

- Serious problems until March 2013 (interference, residual clutter)
- Underestimation in snow (known, user can correct)
- Bad in mountains and in SE Europe

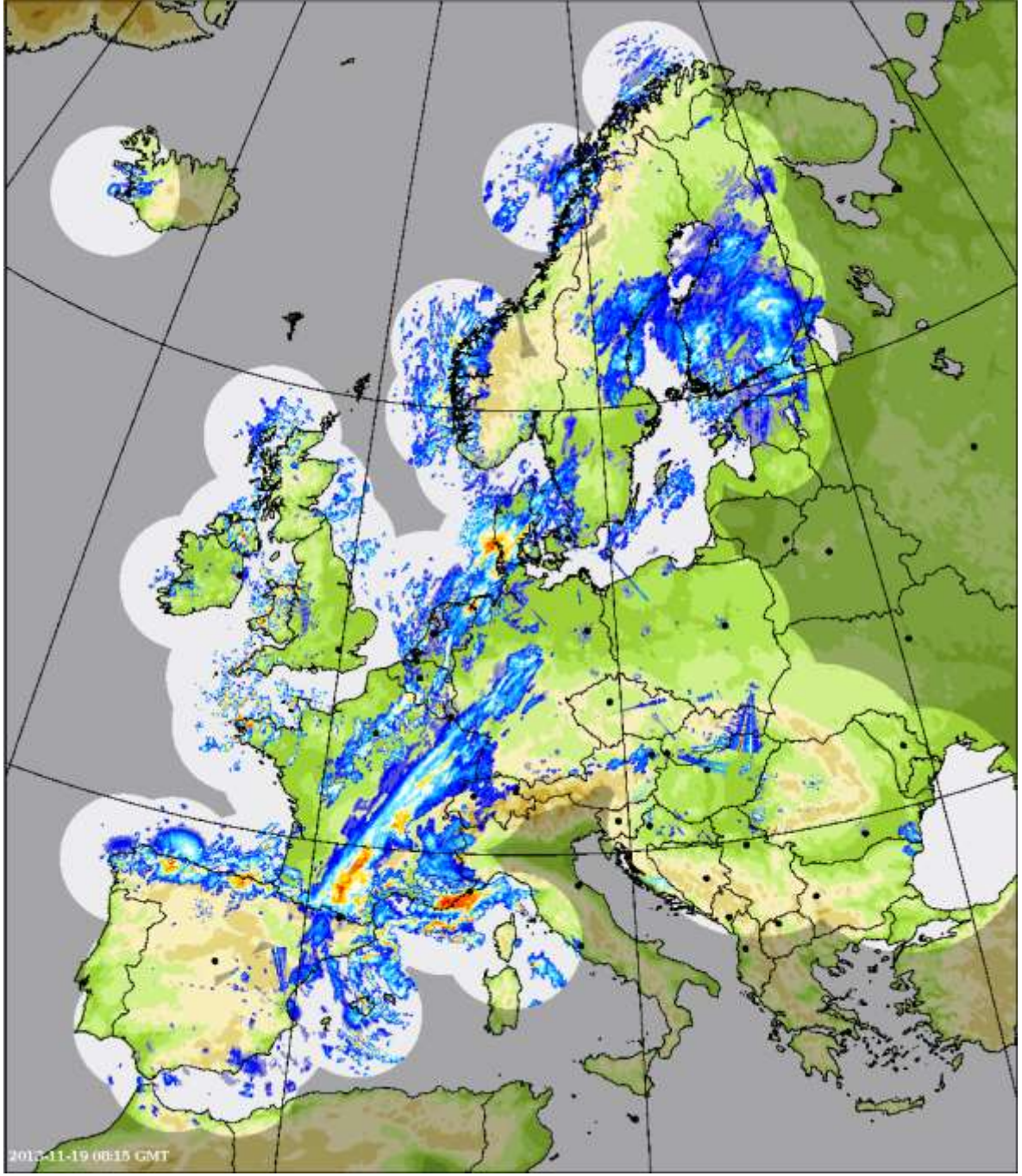
June 2013

- Central clutter cancellation on
- Mountains still there
- Some sea clutter
- Some interference



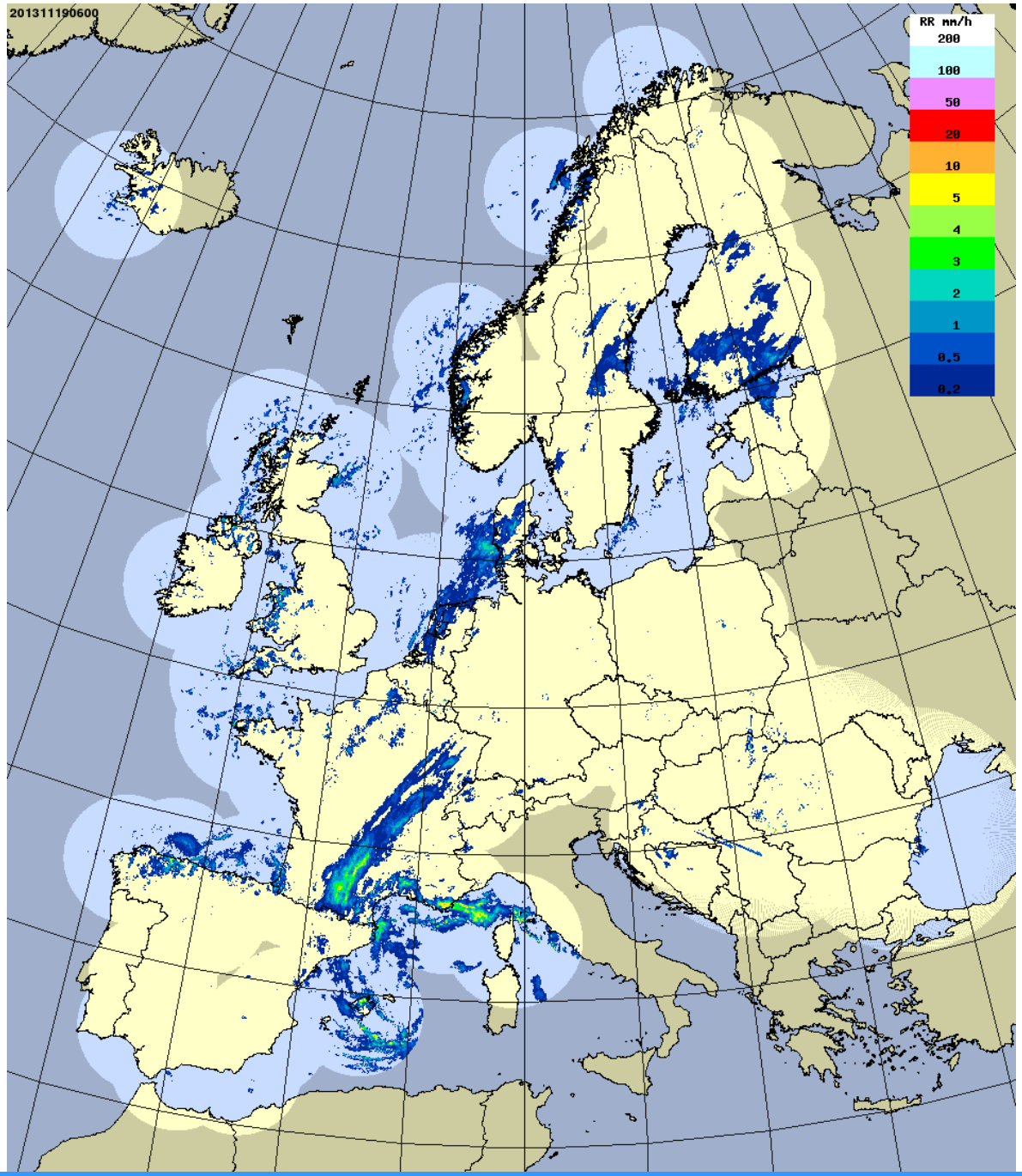
Max refl.

- Which product you use ?
- Here maximum reflectivity
- = maximum trouble



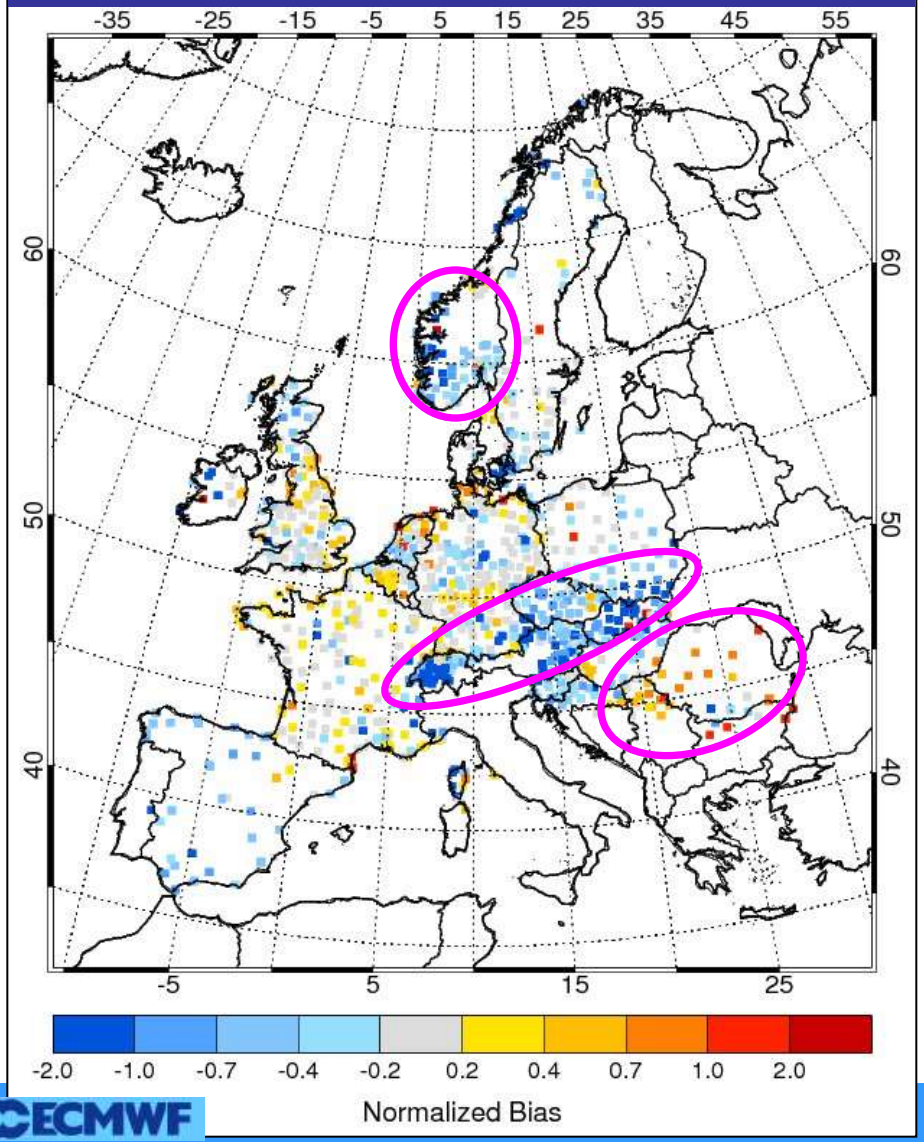
Rainrate

- Less problems
- Missing snow and light precipitation; lower threshold will be changed.
- Colours make a difference too

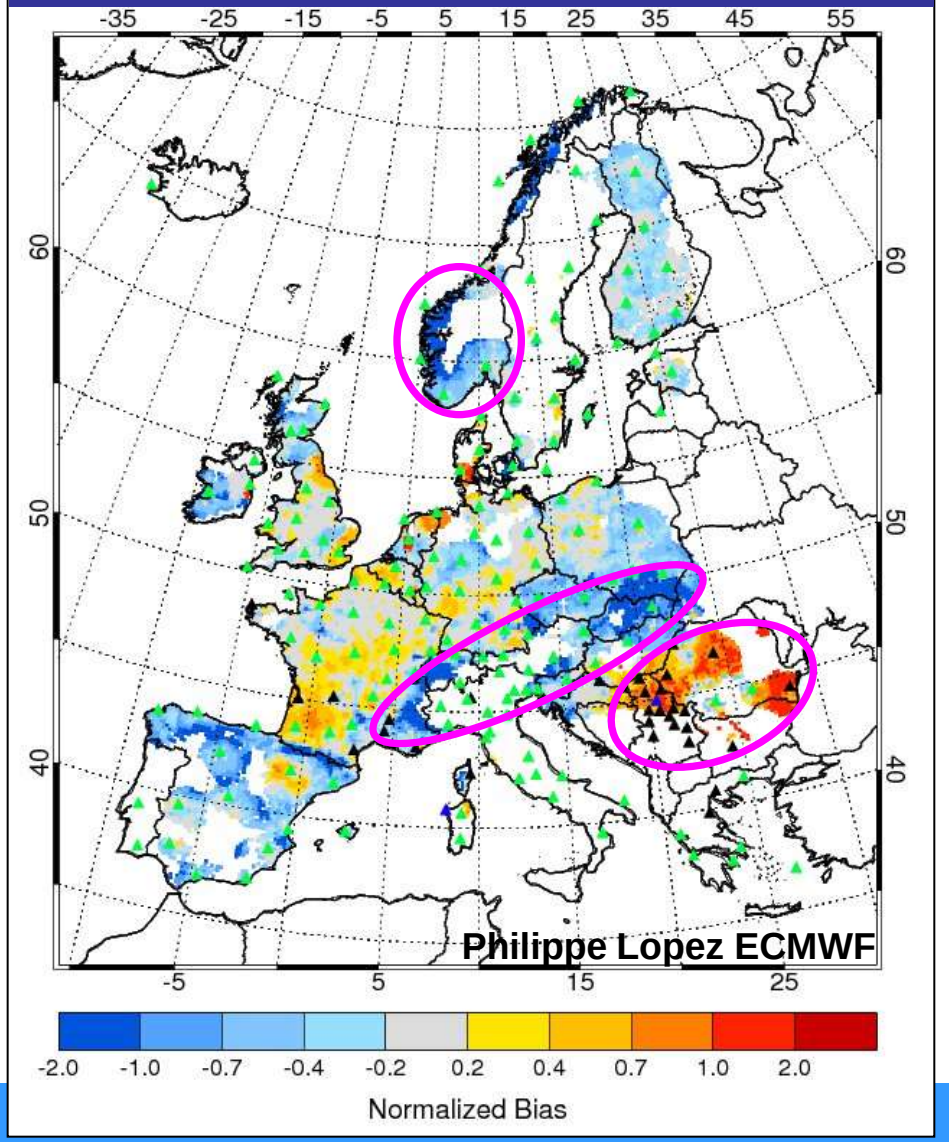


6h-precipitation mean normalized differences between Odyssey and SYNOP / ECMWF forecasts in Spring 2013.

Odyssey – SYNOP

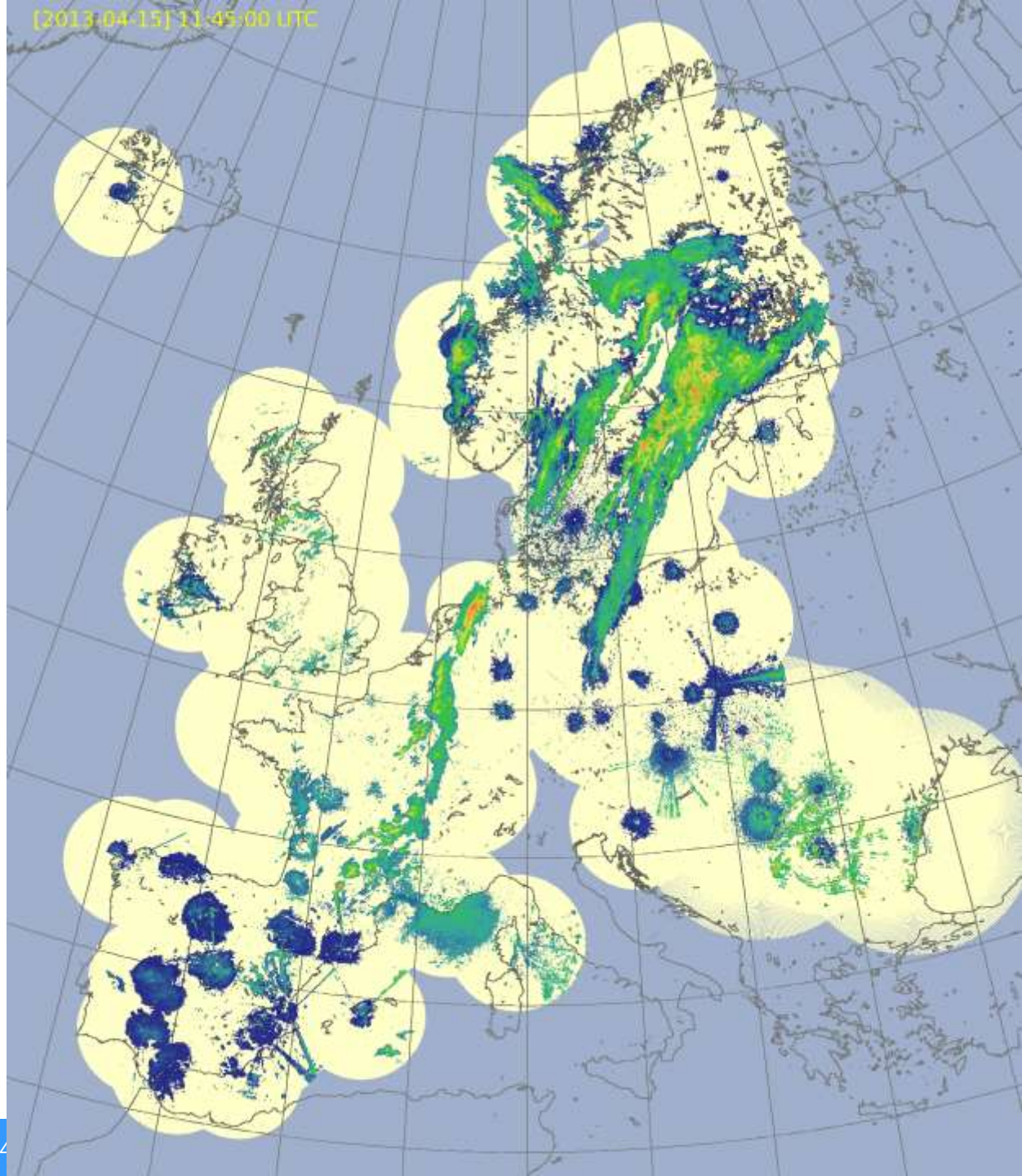


Odyssey – ECMWF forecast



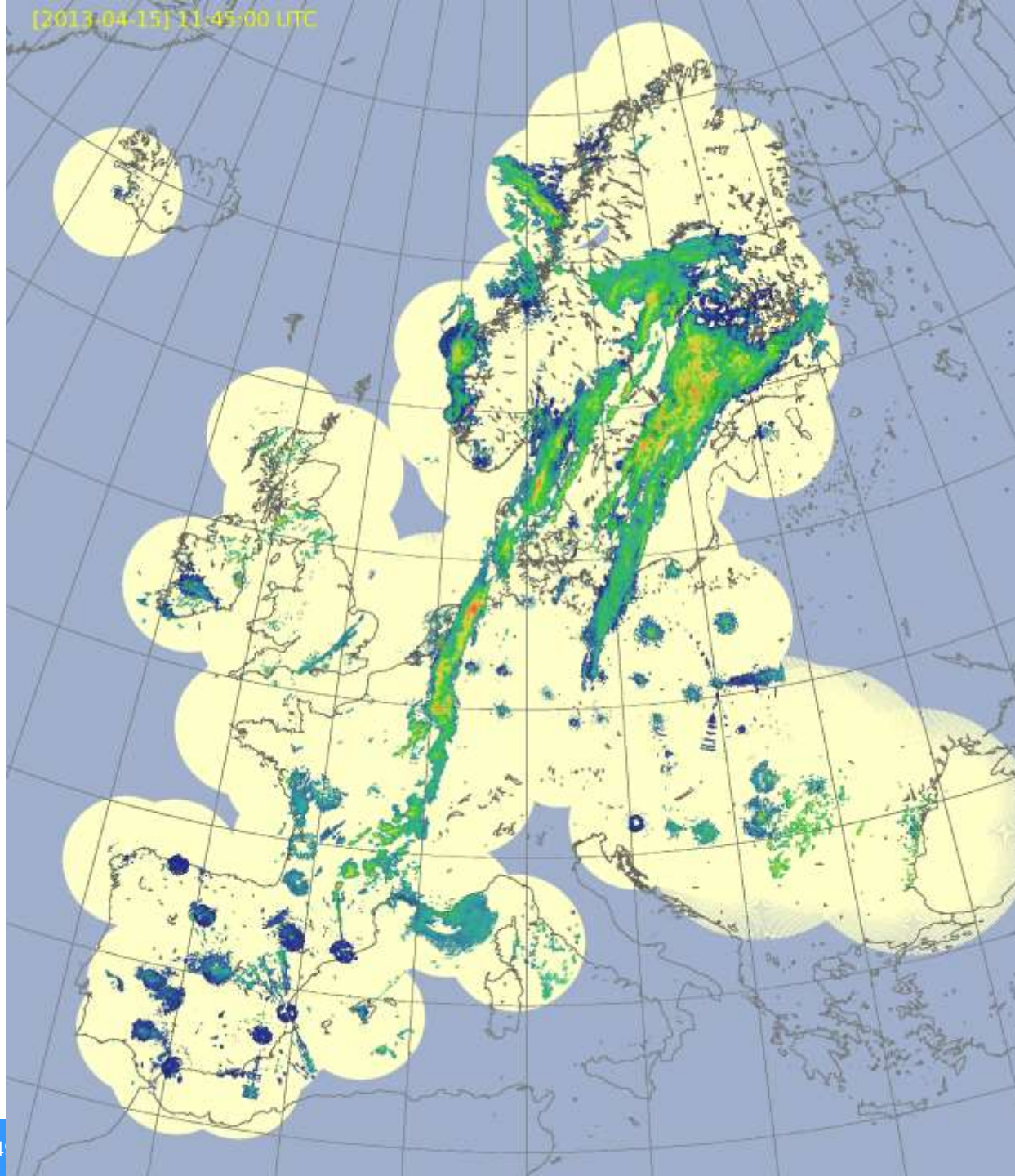
15 Apr 10z

- Max reflectivity
- ”dirty”
- = data as it came to Odyssey

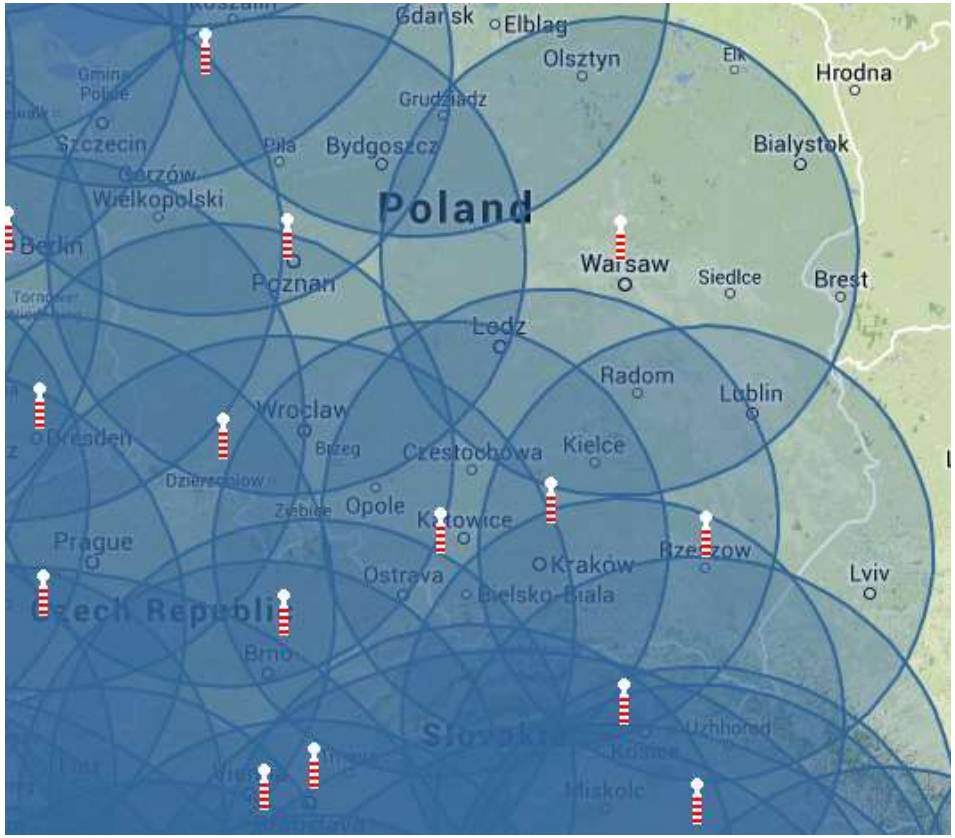


15 Apr 10z

- Max reflectivity
- bRopo and HAC cleaning methods applied



Why composites ?



Example from Poland - Czech Rep - Slovakia

- Average radar measurement range (226 km) is usually larger than the distance between radars (median distance within Opera is 128 km)
- In overlapping areas we can select the best data.

Opera in Europe, Nexrad in USA

- Opera is sometimes referred as "Nexrad of Europe”
- the big difference:
- Opera network is extremely heterogeneous
  - installation date,
  - manufacturers,
  - scanning strategy
  - signal processing
  - and product generation.
- Opera radar density is about twice that of Nexrad.

Data policy

- Composite distributed to members of OPERA and EUMETNET for official duties
- Licences given for Research and education
- Commercial use through ECOMET
- See
- http://eumetnet.eu/odyssey-opera-data-centre

Contact Details

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