Highlights

- ✓ Use of high-resolution observations: RUC studies, use of non-national radar data, Mode-S availability
- ✓ Need for/development of flow-dependent algorithms
- ✓ Radiation intercomparison and phys-dyn interface;
- ✓ GLAMEPS-v2 setup, HarmonEPS physics perturbations experiments
- ✓ Sub-km modelling: coordination, geospatial data
- ✓ HARP and discussions on common validation of new cycles

Assimilation of radar data in HARMONIE

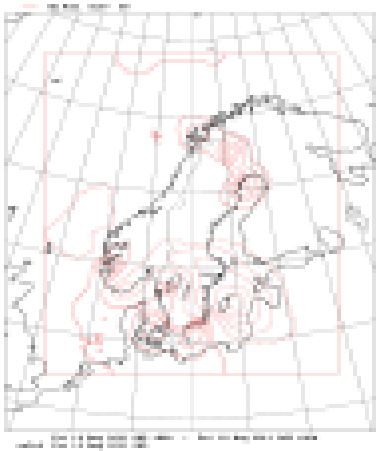
Case study (in collaboration with MetCoOp)
(2.5 km AROME; 65 vertical levels;
DA: 3h RUC 3DVAR;
Forecast + 30h from 00, 06, 12, 18)

Two weeks August 2011

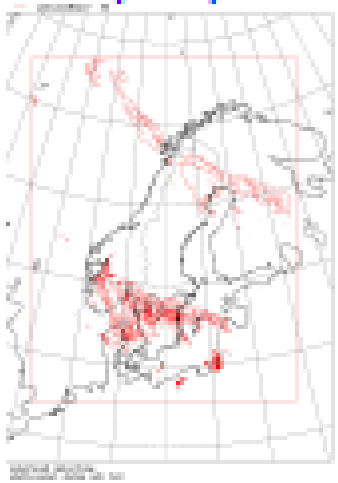
Conventional +
radar radial winds +
reflectivities (no lowest elevation)

Gives clear positive impact on specific humidity and temperature scores in the middle atmosphere (500 hPa)

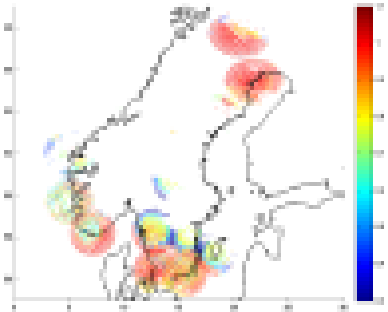
Analysis increment



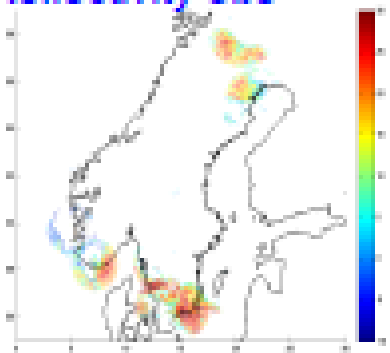
Model precipitation



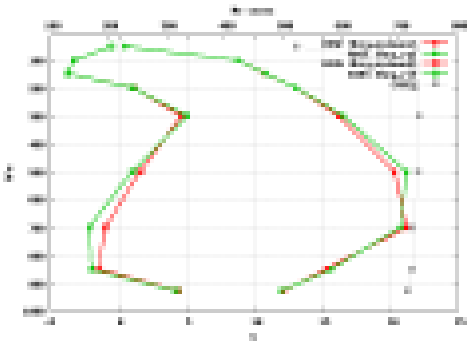
Hum. pseudo-obs



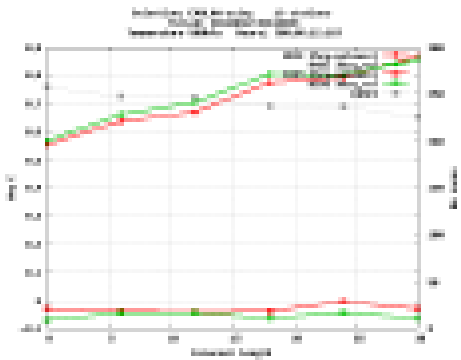
Reflectivity obs



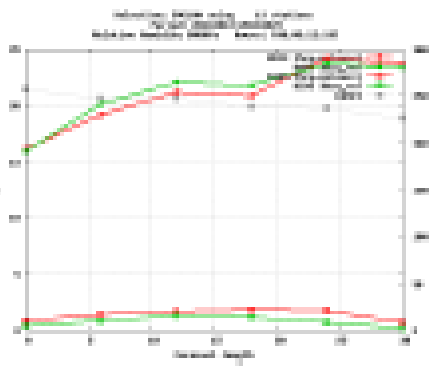
RH-profile



T 500 hPa



RH 500 hPa



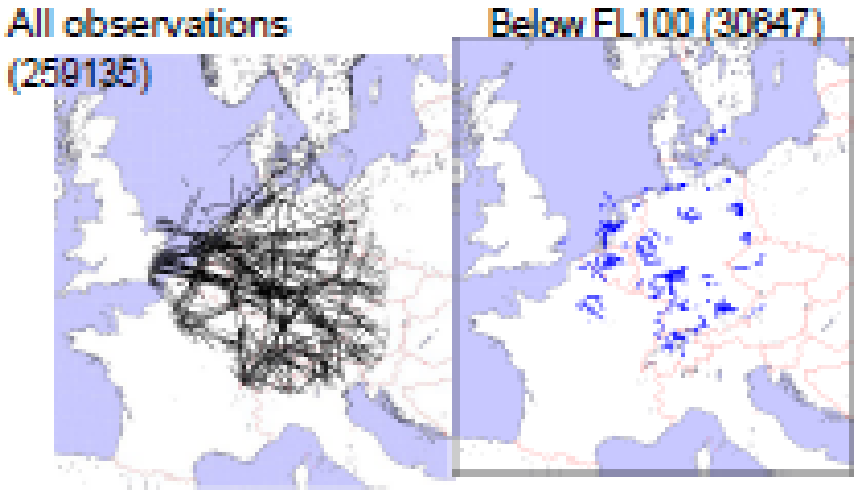
With radar data

No radar data

By Martin Ridal, SMHI

Mode-S observations and data production

Period 2012/08/09 10:00-10:15

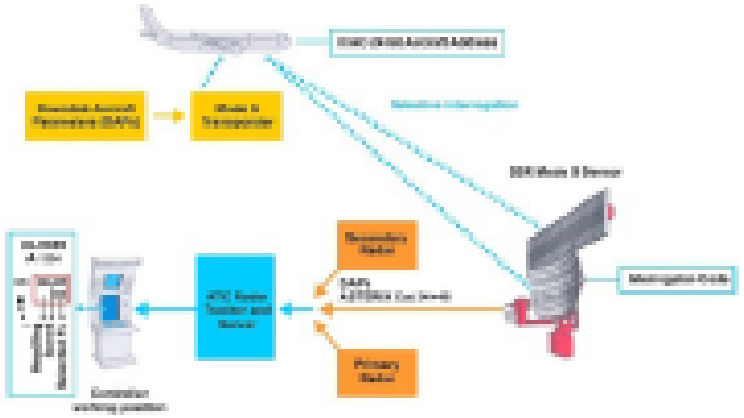


Information on the Mode-S EHS research and the data production status can be found on **http://mode-s.knmi.nl/**

Currently, Mode-S EHS derived meteorological information is available for NMHS, after signing a ***Non Disclosure Agreement.***

Data are available in NETCDF, ASCII and BUFR format each 15 minutes with a delay of 10 minutes

Data can be distributed using personal ftp-account. Contact ***mode-s@knmi.nl***



By Siebren de Haan, KNMI

OOPS/COPE

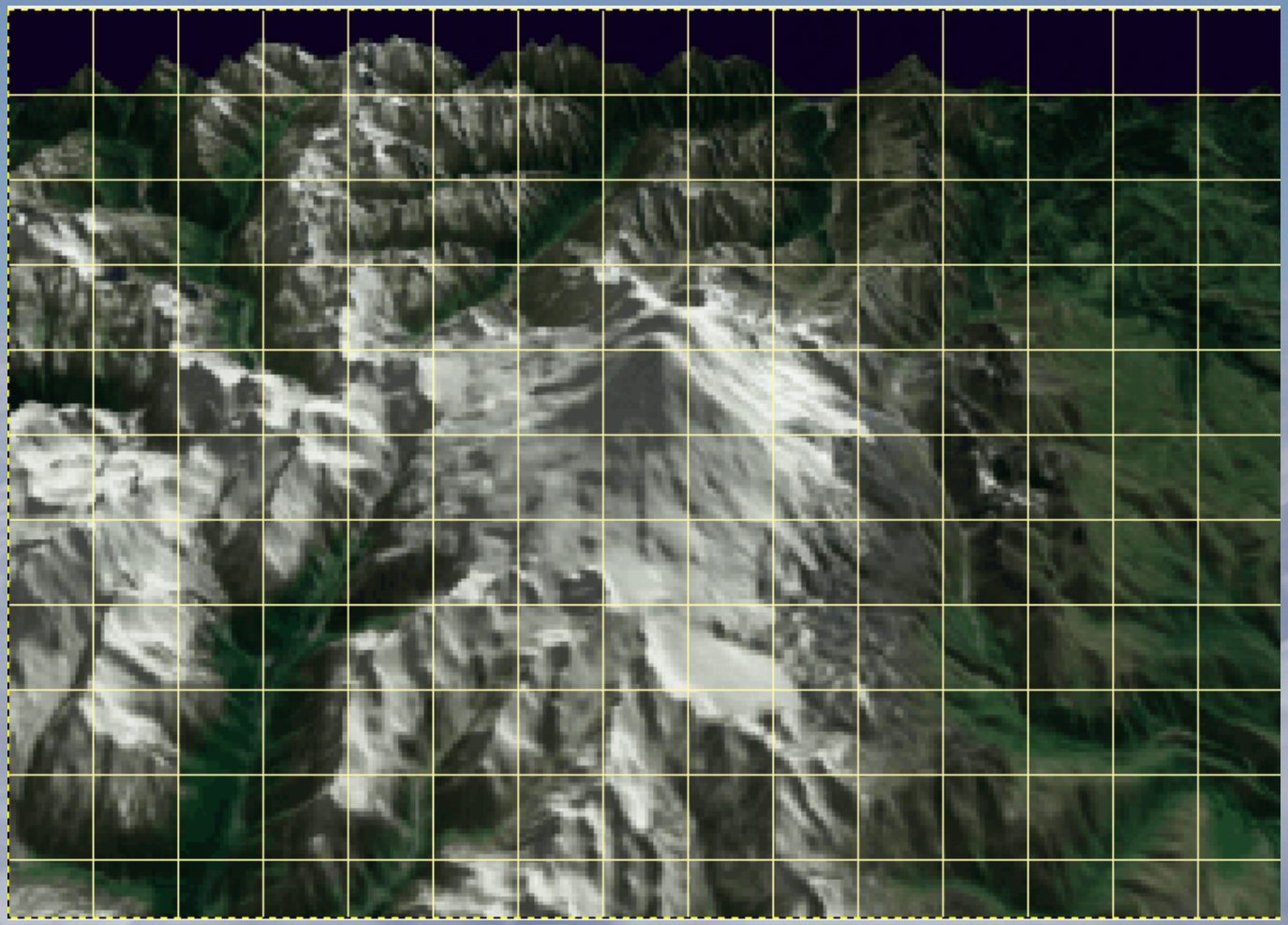
- OOPS:
  - Impacting on DA developments
  - Ecmwf has indicated delays likely.
  - OOPS/C++ training/working week at Ecmwf: November
  - LAM-specific issues adaptations: LBC, forcing
  - design of LAM 4DEnsVar: MF, Hirlam different ideas

- COPE: LAM aspects identified, work packages assigned and work started

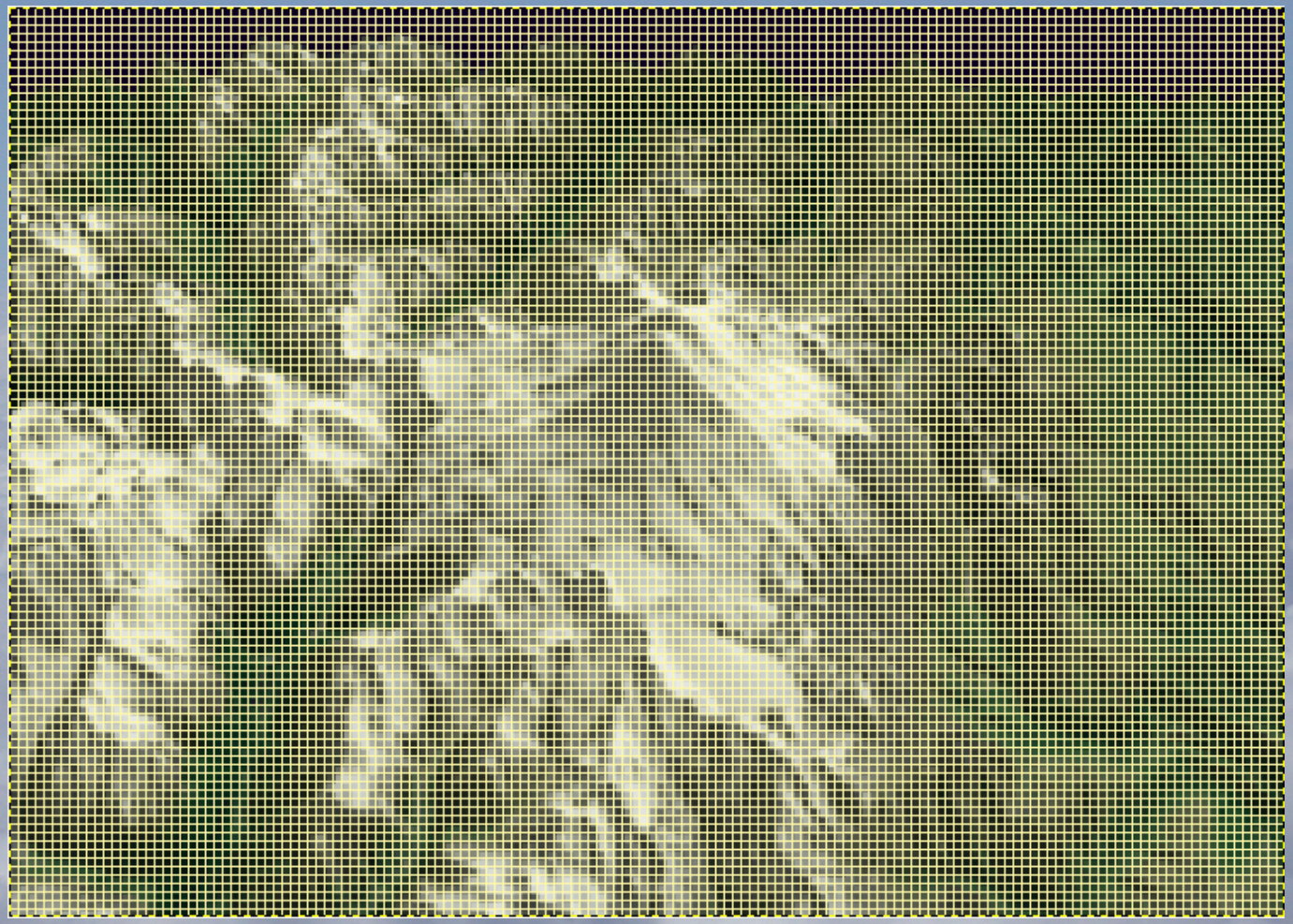
Forecast model

- Dynamics: joint work on Aladin NH VFE scheme
- Cloud working group
- Stable boundary layer: MEB scheme in Surfex, EFB testing
- Radiation intercomparison: intercomparison of radiation schemes within Arome; consistency of radiation, cloud, aerosol treatment; treatment of orographic parametrizations. Tbd in close connection with development of new phys-dyn interface
- Sub-km scale modelling: exchange of experiences/ambitions
- Geospatial data

Geospatial data: testing higher-resolution datasets



gtopo30, deltax 1 km



... or SRTM, deltax < 100 m

Physiography datasets: Ecoclimap-1 and -2

ECOCLIMAP I: sharp gradients in the land use type along Finnish-Russian border, false lakes in Bielorussia => bias in V10m up to 3 m/s in HARMONIE-Lith

ECOCLIMAP II: Performance varies for different domains, but overall better. Some erroneous features remain.

Types of errors:

- Shift – in ECOCLIMAP II!
- Inland seas (sea => lake)
- Missing small lakes/islands
- Curonian lagoon is 40% land

(reported from Lithuania)

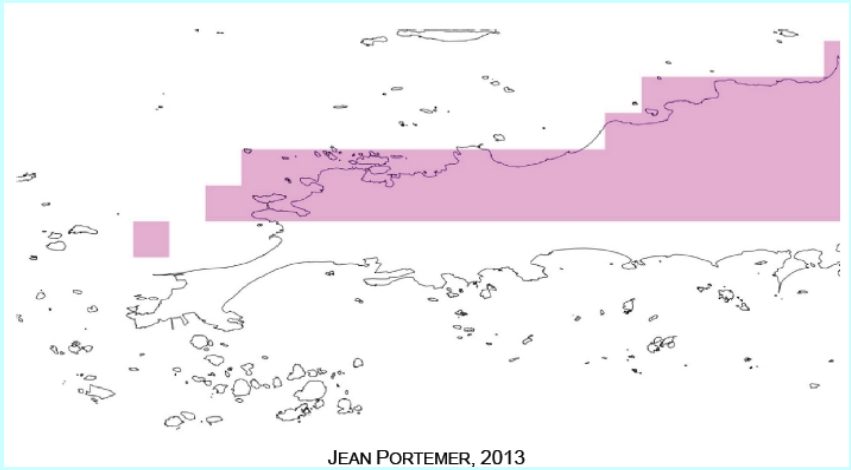
How much of a problem is this?

		ECOCLIMAP		
	%	Land	Lake	Sea
CLC Finland	Land	75.193	3.374	0.666
	Lake	3.108	5.290	0.004
	Sea	0.281	0.026	12.057

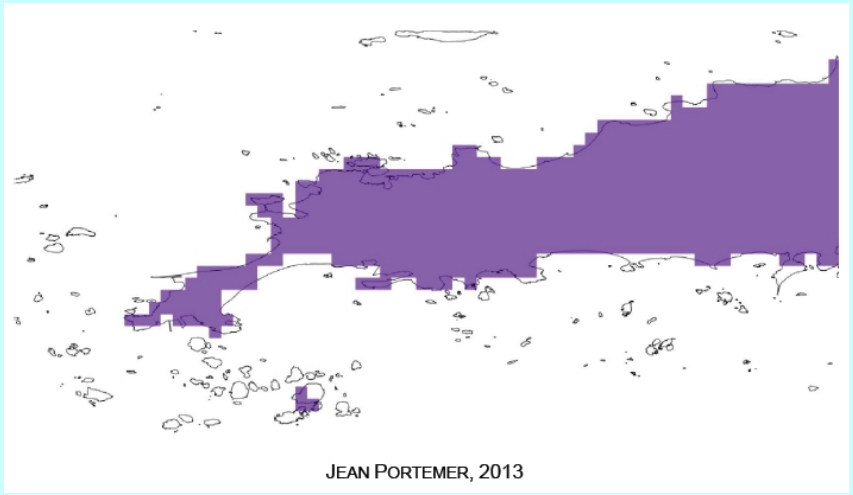
JEAN PORTEMER, 2013

R&D: Physiography

Shift in ECOCLIMAP II



ECOCLIMAP II



GlobCover

Higher resolution experiences

Experiences at sub-km resolutions:

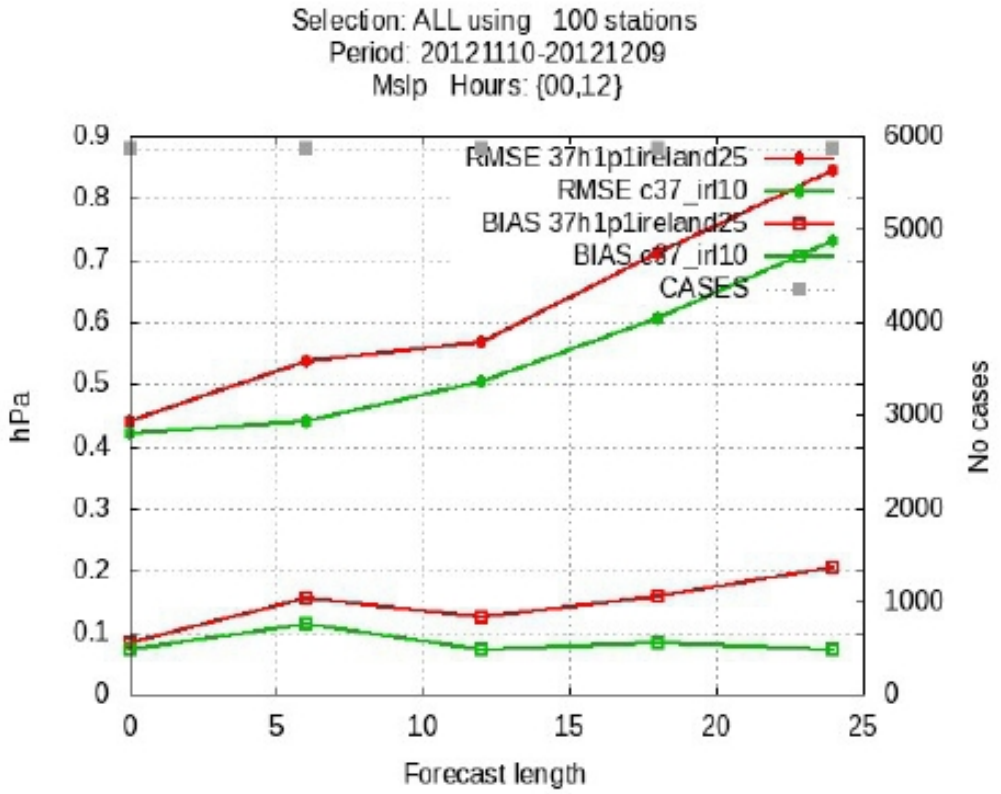
- Experience gained with various high-resolution geospatial datasets
- Instabilities/crashes near model top: recommended dynamics settings to minimize this
- No real problems seen with shallow convection/turbulence behaviour sofar

Open scientific questions for hectometric resolutions:

- (When) do we need some 3D features (radiation, turbulence)?
- Which shallow convection scheme do we need ? When explicit?
- Coupling frequency, coupling zone size.
- Physiographic fields resolution.
- Volume of the data to treat.
- Which turbulence parameters, turbulence mixing length?

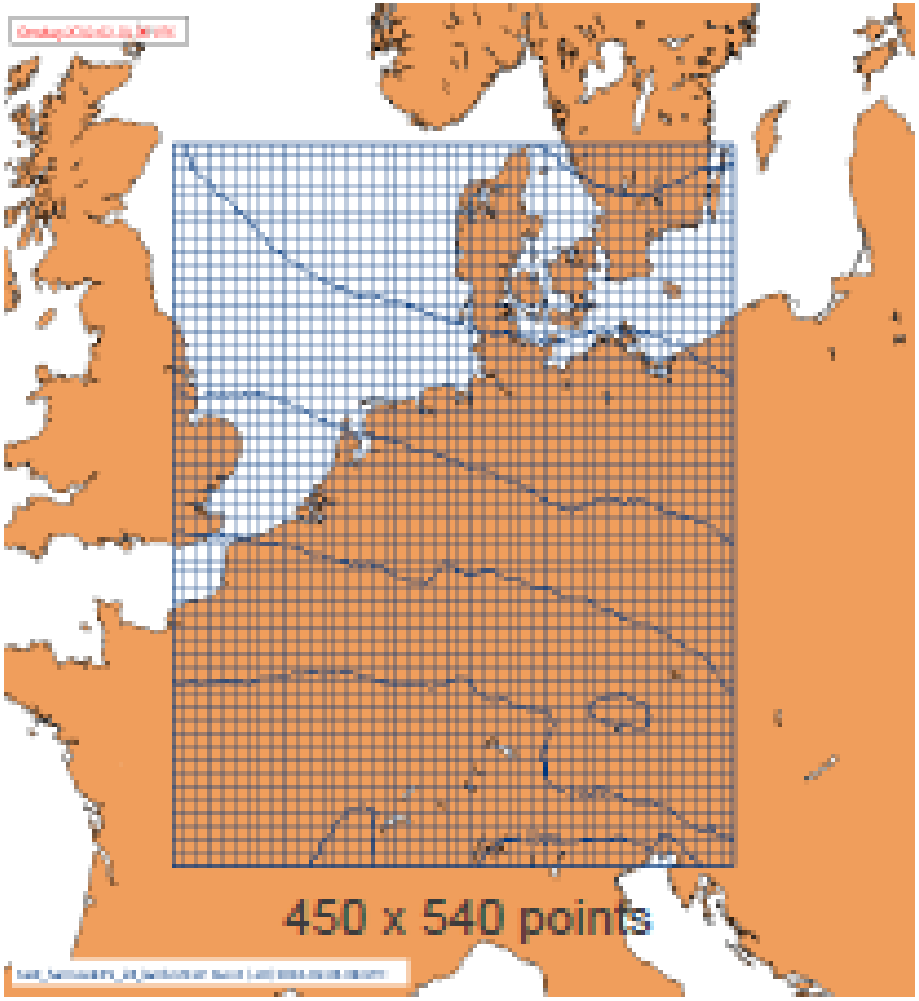
An Irish example of VFR experiments

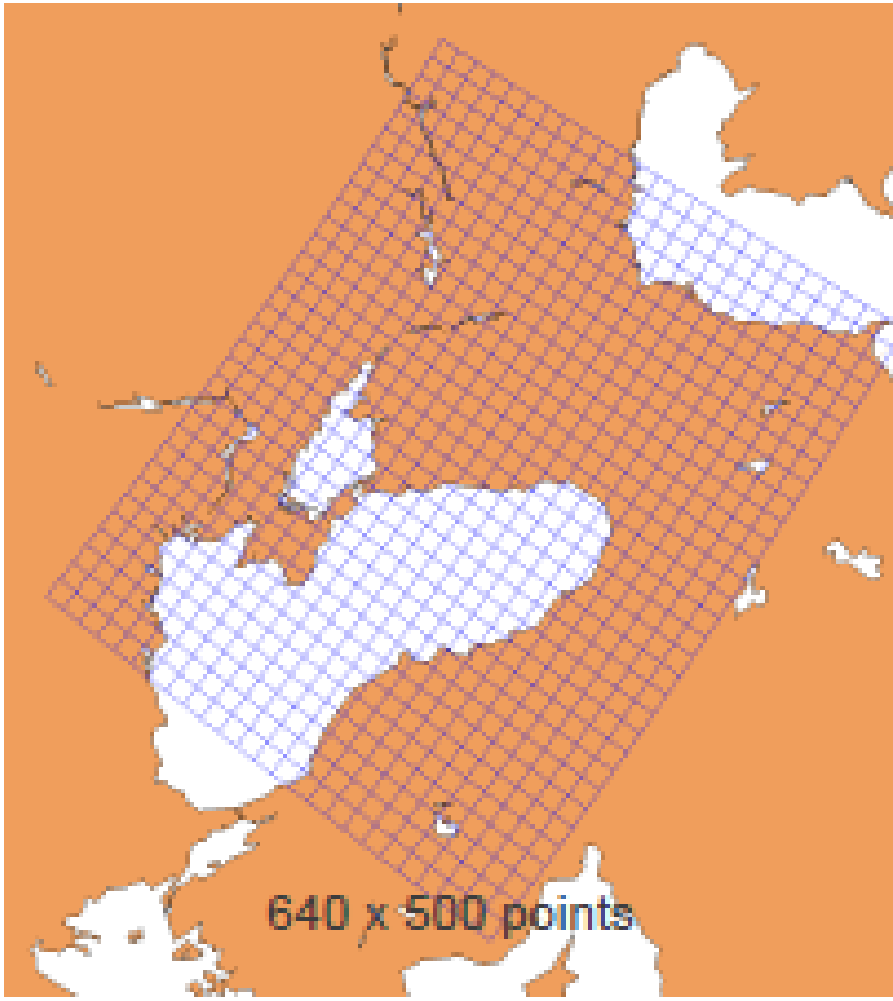
The value of 1-km resolution Harmonie (c37_irl10)
Over 2.5km resolution Harmonie (37h1p1ireland25)



HarmonEPS

First areas for experimentation





HarmonEPS

- ✓ Setup: 20+2 members with AROME/ALARO physics, and surface ass for all members. Run for 06, 18h UTC, up to +36h. Control run: full 6h cycling

- ✓ 3h Nesting experiments with 32/16km ECMWF EPS: little impact
  To be done: 3h vs 1h LBC

- ✓ Forecast model perturbations:
  - stochastic perturbation of tendencies (SPPT) in Arome: simplified version ("box-SPPT" for all tendencies)
  - cellular automata in Alaro

  Planned:
  - perturbations from humidity SV's, MSG cloud mask
  - stochastic perturbations in several (microphysics, cloud) parametrizations
  - surface perturbations: soil moisture, snow, SST, exchange coefficients
  - hybrid 3D-VAR
  - physics parameter perturbations: learn from experiences LAEF

Meteorological quality assessment

- H-A cooperation on validation/verification: Development of HARP
  - Initial focus on probabilistic verification/visualization; ready for routine use
  - Now on to spatial verification

- Exercise on assessing use of Harmonie system for validation of new cycles in Aladin: Turkey, October, Cy38t1; how to follow up?