

Definitions/discussion of RCM integration domains

Below are maps of integration domains employed in the various RCM simulations in PRUDENCE.

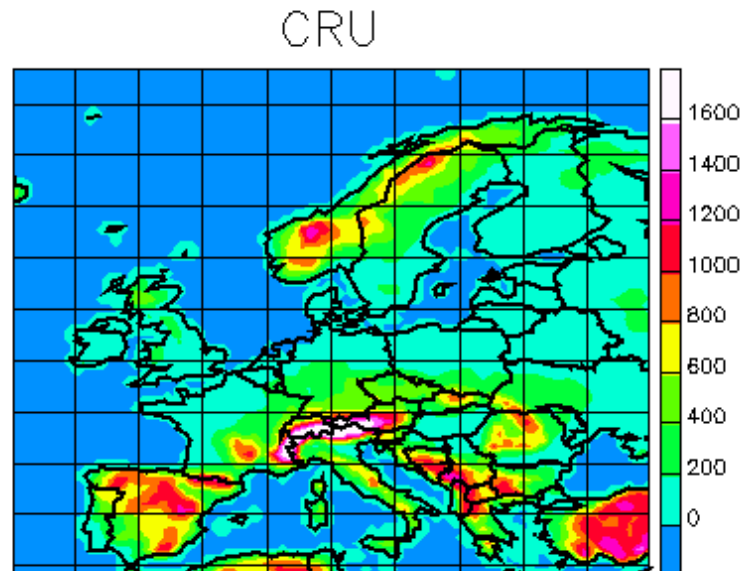
NOTE that the parameters quoted below apply to the INTERIOR part of the RCM domains. The actual area in the computers then corresponds to extra 2 times 8-11 boundary points in each dimension. In the "standardized" maps below, the interior part is colored, and the full map area includes the relaxation zone.

I have collected the data for the relevant domains in the following table, where all longitudes and latitudes are in the rotated coordinate systems. Most of the parameters are not applicable to the Lambert projection of ICTP and UCM.

Model	#longitudes	#latitudes	Grid distance	West	East	South	North	SP longitude	SP latitude
CRU domain	100	80	0.5	-14.75	34.75	35.25	74.75	0	-90
HadAM	81	65	1.875x1.25	-60.00	90.00	10.00	90.00	0	-90
HadAM winds	81	64	1.875x1.25	-60.9375	89.375	10.625	89.375	0	-90
HadRM	90	95	0.44	-17.24	21.92	-21.34	20.02	10	-38
HadRM winds	90	94	0.44	-17.02	22.14	-21.12	19.80	10	-38
DMI 50km	90	84	0.44	-28.25	10.91	-18.22	18.30	27	-37
DMI 25km	174	170	0.22	-28.25	9.81	-18.22	18.96	27	-37
SMHI 50km	90	86	0.44	-28.48	10.68	-23.32	14.08	25	-32
SMHI 25km	190	186	0.22	-29.80	11.78	-24.86	15.84	25	-32
ETH	65	75	0.50	-15.50	16.50	-21.00	16.00	10	-32.5
MPI	81	93	0.50	-15.50	24.50	-30.00	16.00	10	-32.5
MPI 3002	93	105	0.50	-16.50	29.50	-35.00	17.00	10	-32.5
GKSS	85	91	0.50	-17.50	24.50	-27.50	17.50	10	-32.5
KNMI	94	80	0.44	-32.28	8.64	-26.52	8.24	23	-28
UCM	93	77	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICTP	97	76	N/A	N/A	N/A	N/A	N/A	N/A	N/A
METNO	85	85	0.5	-19.5	22.5	-23.5	18.5	0	-25

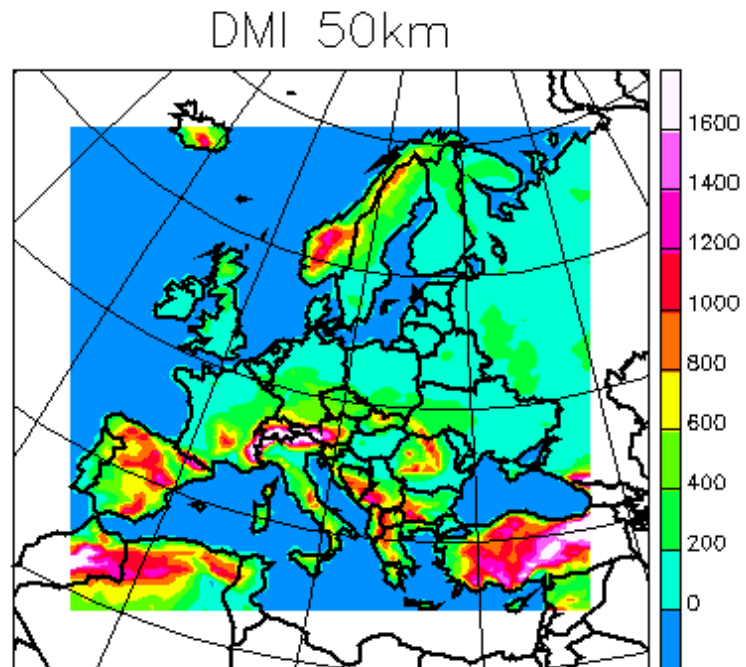
The CRU domain

The CRU domain, on which total monthly and seasonal fields from all RCM and stretched-GCM runs exist, looks like this; the lattice is 100x80, $[-14.75, 34.75, 35.25, 74.75, 0, -90]$, i.e., a regular 0.5x0.5 degree grid. There is a netCDF file with orography and land/sea mask [here](#).

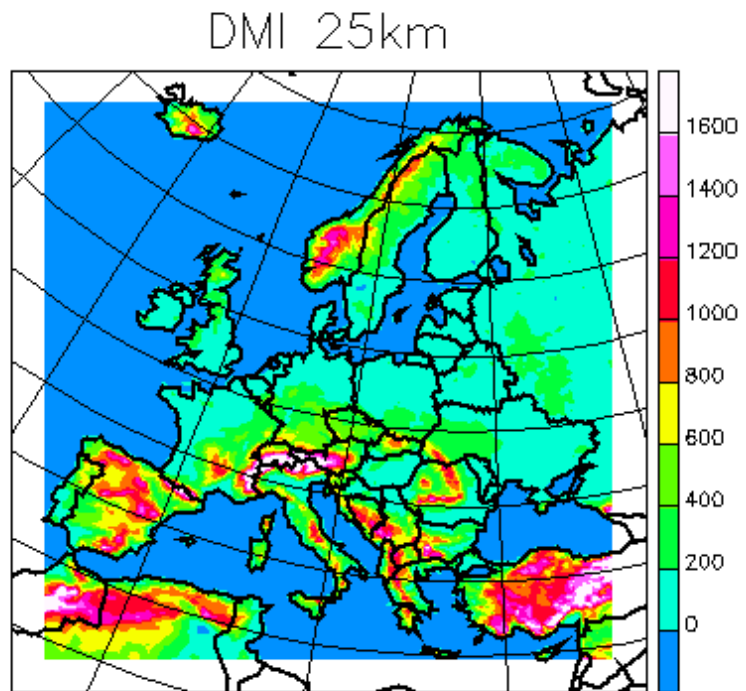


DMI

Currently, our so-called E50 domain is defined as a regular, rotated lat/lon lattice. The south pole of the rotated lattice is in actual (lon,lat)=(27,-37) degrees; in the rotated lattice, which has its 0 longitude through the actual poles, the (regular) subarea is defined by longitudes -32.65 and 15.31 and with latitudes -22.62 and 22.7; the grid distance is 0.44 degrees, making the grid size 110x104. As a shorthand for this lattice I will write $[-32.65, 15.31, -22.62, 22.7, 27, -37]$. Since the boundary relaxation zone is 10 points wide, the interior area is $[-28, 25, 10.91, -18, 22, 18.3, 27, -37]$. The integration area corresponds to the full map, the interior (or free) area corresponds to the colored part of it. We only include data for the interior part of the map.

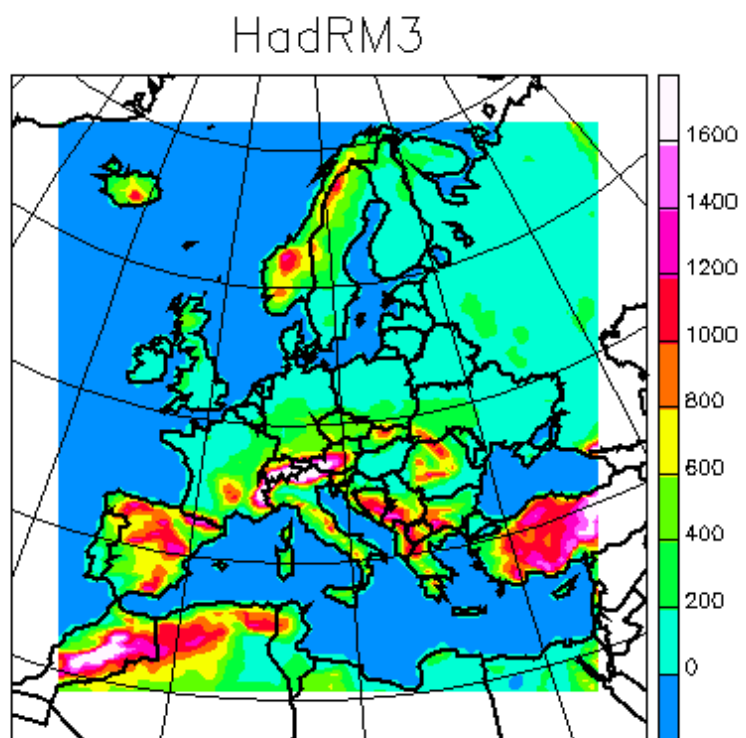


Our high-resolution area is a tiny bit smaller than the 50km area in twice the resolution. It is 174x170 in 0.22 degrees resolution, and the (interior) lattice is [-28.25,9.81,-18.22,18.96,27,-37]. The relaxation zone is 10 points.



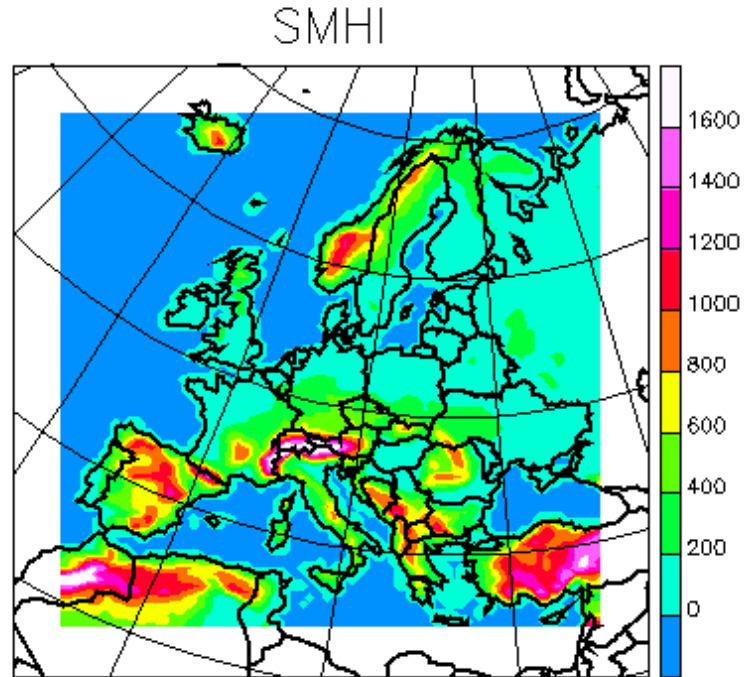
HadRM3

The area of the HadRM3P (and HadRM3H) simulations can be described as [-17.24,21.92,-21.34,20.02,10,-38] with 0.44 degrees resolution, corresponding to 90x95 points; a boundary zone of 8 points has been removed. The wind fields are on a staggered grid of 90x94 points, [-17.02,22.14,-21.12,19.8,10,-38].



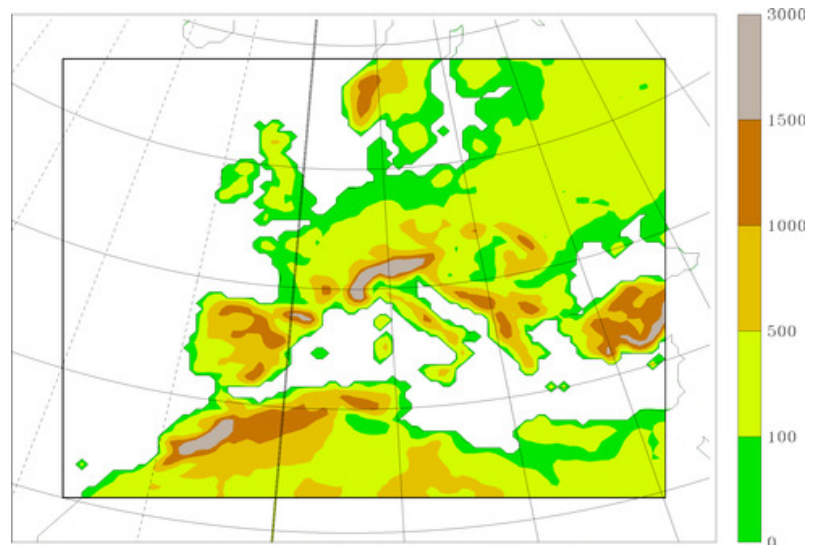
SMHI

The SMHI area is the same projection and the map $[-32, 14.2, -26.84, 17.6, 25, -32]$ and a lattice distance of 0.44 degrees and 90x86 interior points. This area is almost coinciding with the original DMI area; the full area is shown in the figure as the colored part.



UCM

Domain characteristics: Lambert conformal projection centered in 45N lat and 6E lon. The horizontal coordinates are cartesian. The domain is composed of a total 112x96 grids each of 50x50 km². The integration area corresponds to the full area, and the free-area is the interior, colored part.



ETH

The current CHRM domain corresponds to the traditional EM domain used at IAC ETH for many years.

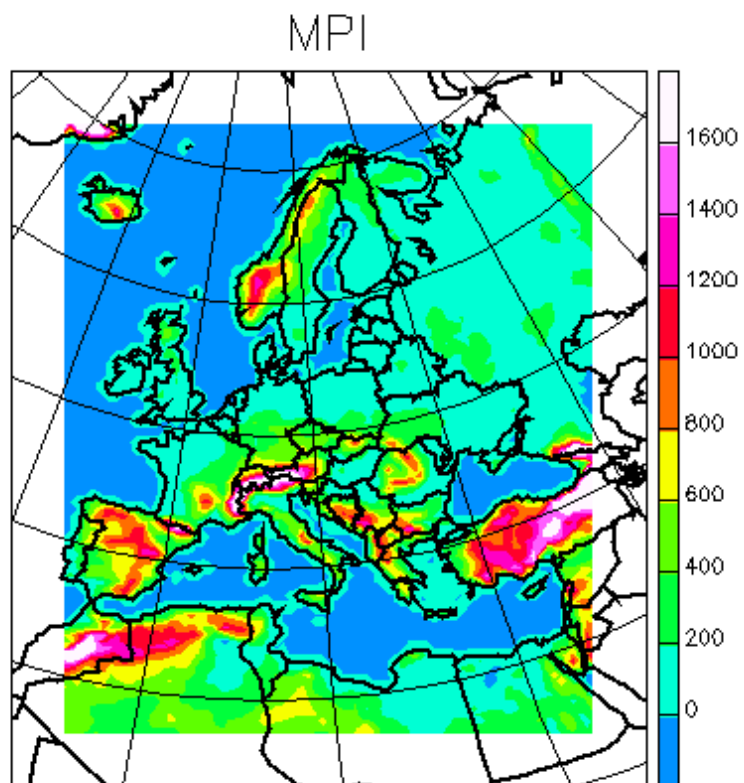
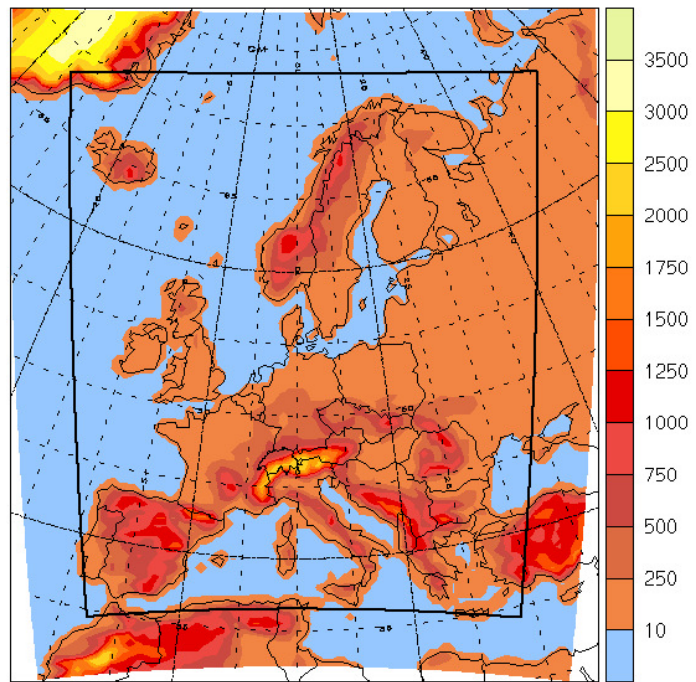
It is defined as a regular, rotated lat/lon grid with a grid spacing of 0.5 degrees, corresponding to roughly 56 km over Europe. The grid is composed of 81(x) by 91(y) points. The north pole of the rotated grid is positioned at (lon,lat)=(-170,32.5) degrees so that in geographical coordinates the domain is defined at its center as spanning longitudes 20W to 45E and latitudes 35N to 75N

The model integration area corresponds to the full map, while the nudging region is composed of the outermost 8 points, so that the interior (free) region is delimited by the rectangular box.

As part of our plans we are thinking of testing an extension of the domain to the south and to the west, probably by 10 grid points each.

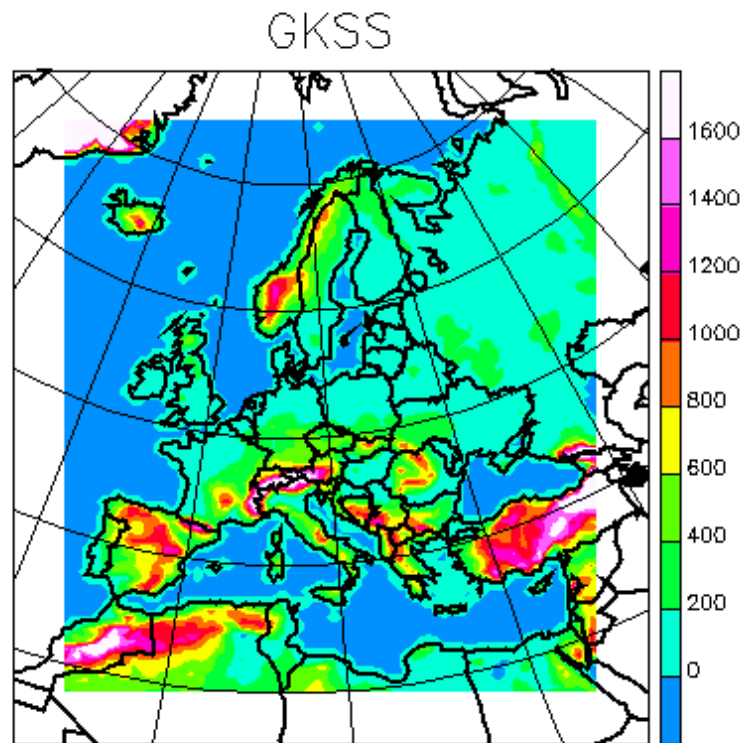
MPI

Like the HadRM3H domain the REMO domain is defined on a quasi-regular rotated lat/lon grid. The rotated north pole is at (170W, 32.5N) in usual geographical coordinates; the horizontal resolution is 0.5 degrees (~56 km). The domain consists of 97 * 109 grid points (see figure). The orography is shown only in the free-flowing area of the model domain; the eight outermost grid points are constrained by the lateral boundaries.



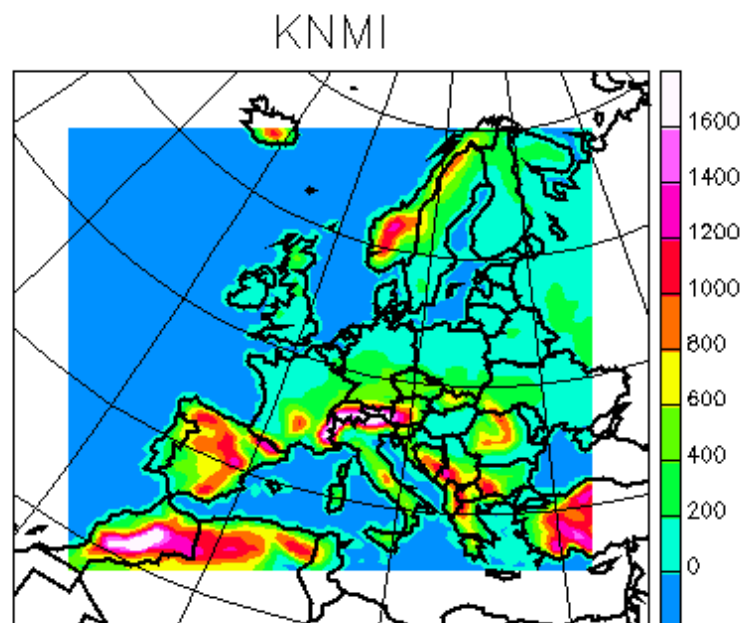
GKSS

The CLM is defined on a quasi-regular, rotated lat/lon grid. The north pole is rotated to (lon,lat)=(-170., 32.5) degrees. The horizontal resolution is 0.5 degrees (i.e. about 56 km). -NOTE the definition is not the original one! This page changed 030925. The parameters of the interior area are [-17.5,24.5,-27.5,17.5,10,-32.5]



KNMI

The KNMI simulations can be described as [-32.28,8.64,-26.52,8.24,23,-28] with 0.44 degrees resolution, corresponding to 94x80 points; a boundary zone of 10 points has been removed.



met.no

The met.no area of the HIRHAM simulations can be described as [-19.5,22.5,-23.5,18.5,0,-25] with 0.5 degrees resolution, corresponding to 85x85 points, a boundary zone of 5 points has been removed (6 points at the eastern and northern boundary). The full area is 96x96 points [-22.0,25.5,-26.0,21.5,0,-25].