

## Meta data description for RCM model simulations in ENSEMBLES RT3

### ERA40@25km Simulations

#### 1. General:

1.1 Name of model  
RACMO2

1.2 Version  
Version 2.1

1.3 Reference

RACMO2.1 is documented in:

Meijgaard, E. van, L.H. van Ulft, W.J. van de Berg, F.C. Bosveld, B.J.J.M. van den Hurk, G. Lenderink, A.P. Siebesma, 2008:

*The KNMI regional atmospheric climate model RACMO, version 2.1.* KNMI Technical Report 302, 43 pp. Available from KNMI, Postbus 201, 3730 AE, De Bilt, The Netherlands.  
<http://www.knmi.nl/bibliotheek/knmipubTR/TR302.pdf>

RACMO2.1 is used in all European domain ENSEMBLES integrations.

Physics package of RACMO2 is based on ECMWF model cycle 23 release 4 (also used in ERA40 reanalysis project). Documentation is found in  
White, P.W. (ed.), 2002: Physical processes (CY23R4). *IFS documentation*  
<http://www.ecmwf.int/research/ifsdocs>

Performance of RACMO2.0 and physics updates with respect to original ECMWF formulation are described in:

- i) G.. Lenderink, B. van den Hurk, E. van Meijgaard, A.van Ulden and J. Cuijpers, 2003: *Simulation of present-day climate in RACMO2: first results and model developments*, KNMI Technical Report 252, 24 pp.
- ii) C. de Bruijn and E. van Meijgaard, 2005: *Verification of HIRLAM with ECMWF physics compared with HIRLAM reference versions*, HIRLAM Technical Report 63, 39 pp.

1.4 URL  
None

#### 2. Model setup (25km resolution European domain):

2.1 Grid specifications:

2.1.1 Projection

Rotated latitude-longitude:	POLAT=-39.25° ,	POLON=18.00°
Horizontal bounds (in rotated frame):	WEST=-25.90° ,	SOUTH=-24.42°
	EAST=19.20°.,	NORTH=24.64°

2.1.2 Number of horizontal grid points

Model domain: NLONxNLAT=206x224

Ensembles domain: 170x190

2.1.3 Number of vertical levels : 40

2.1.4 Type of vertical coordinate  
hybrid

2.2 Soil and surface specifications

2.2.1 Name of soil and SVAT model

TESSEL: Tiled ECMWF Scheme for Surface Exchanges over Land

2.2.2 Physiographical data

*e.g. orography, LSM, LAI, soil type etc.*

*for each please provide*

Name, source, figure

*e.g. orography, GTOPO30, figure*

Orography related parameters are aggregated from GTOPO30

LSM and surface characteristics are compiled and aggregated from ECOCLIMAP.

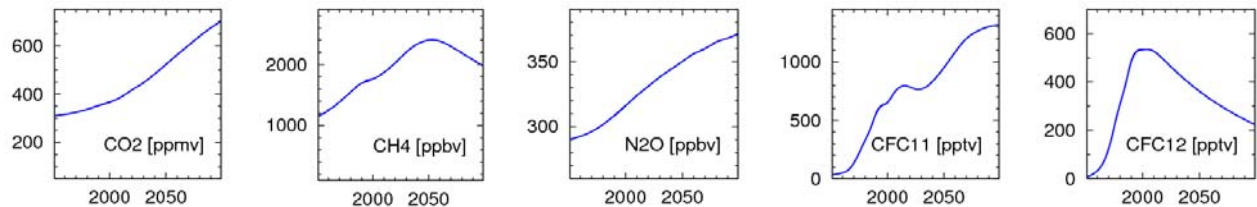
Surface characteristics include: i) type of high vegetation , ii) fractional coverage with high vegetation, iii) type of low vegetation, iv) fractional coverage with low vegetation (see figures)

2.3 External Forcings

*e.g. solar constant, green house gas concentration, aerosols*

- solar constant: 1370 W/m<sup>2</sup>

- GHG-concentrations in the period 1950-2100 are prescribed following the SRES-A1B emission scenario:



- Ozone: climatology distributing the ozone mixing ratio as a function of pressure, latitude and month following Fortuin and Langematz (1994; *Atmos. Sensing and Modeling*, **2311**, 207-216)

- Aerosols: four types of aerosols (maritime, continental, urban, desert) geographically distributed according to Tanré climatology (1984; in *Aerosols and Their Climatic Effects*, 133-177)

**4. Additional information on model set up**

**5. Information on the performance**

**6. Email address for contact person:**

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