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D2B.24 Results of the 'quick-look' analysis of the RCM simulations

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Revision [1]

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Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	



ENSEMBLES RT2B

Deliverable D2B.24

**Results of the 'quick-look' analysis
of the RCM simulations**

Preliminary Version

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Introduction

This version of Deliverable D2B.24 shows some results of the so-called “quick-look” analysis, as it was implemented according to Deliverable D2B.21 “Description of the ‘quick-look’ analysis procedure for the RCM scenario simulations”. At the General Assembly 2007 in Prague first results of this analysis were presented, and it was decided to extend the analysis (see below for details). An updated version of this Deliverable will be submitted, when these extensions are incorporated into the analysis.

Overview and objectives of the ‘quick-look’ analysis

Within the present Deliverable, first results of the so called ‘quick-look’ analysis are described. The basic idea is to present on a protected web site the evolution of trends and variability of a few key parameters for all transient RCM control and scenario runs which are done within RT2B.1.

The ‘quick-look’ analysis has the following objectives:

- To monitor the scenario simulations progress and quality:
In WP2B.1, several regional modelling groups are applying their RCMs for transient simulations using emissions after IPCC SRES A1B on a scale of 25km horizontal resolution for the time period 1950-2050, some of them until 2100. Sometimes errors in the model setup lead to multiple executions of the computationally intensive transient simulation. Knowledge of the placement of a simulation in the band of the other ENSEMBLES RCM simulations after a simulation progress of some decades could help to identify any such errors.
- To provide very fast first information on the performance of the RCM scenarios:
The results of the transient RCM simulations will serve as input to WP2B.2 and WP2B.3 and other RTs, in particular RT6. Some of these are mainly interested in general trends of basic meteorological quantities like temperature or precipitation. Therefore it is desirable to provide as fast as possible trends of mean values and variability for some key variables after completion of the runs. Additionally, these results may lead to an early publication giving highlights on the experiments.

Variables:

The “quick-look” analysis has been done for the following list of variables:

- 2m-Temperature
- Precipitation
- Evaporation

Up to now, the analysis has been done for the RCM results themselves. Following the discussions in Prague, it is also planned to include the results of the associated GCM providing the boundary data and these will be published in the extended version.

Analysis Areas:

The analysis has been performed for the following areas defined within the PRUDENCE project (see Fig.1).

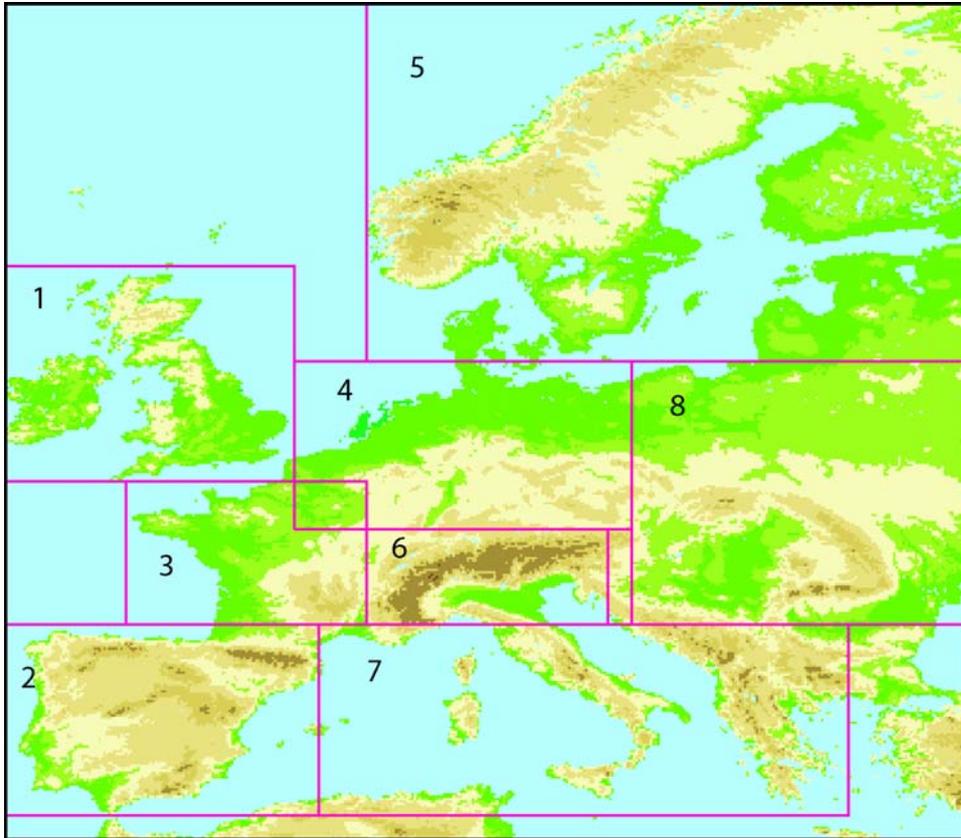


Fig.1: PRUDENCE areas.

Results of the analysis:

For each area and each of the analysis quantities, a line graph plot showing all available results from all ENSEMBLES RCM transient runs was created. As it is not possible to include all these figures into this Deliverable, only some example plots of the analysis will be shown in the following: for each kind of analysis plot, an example plot for PRUDENCE region 4 (Mid-Europe) is shown:

Yearly mean values:

For each simulated year, a yearly mean (2m-temperature) or yearly sum (precipitation, evaporation) has been computed for each analysis region. Figures containing these values for all RCMs have been produced for each analysis variable for each analysis region (e.g., Figures 2-4).

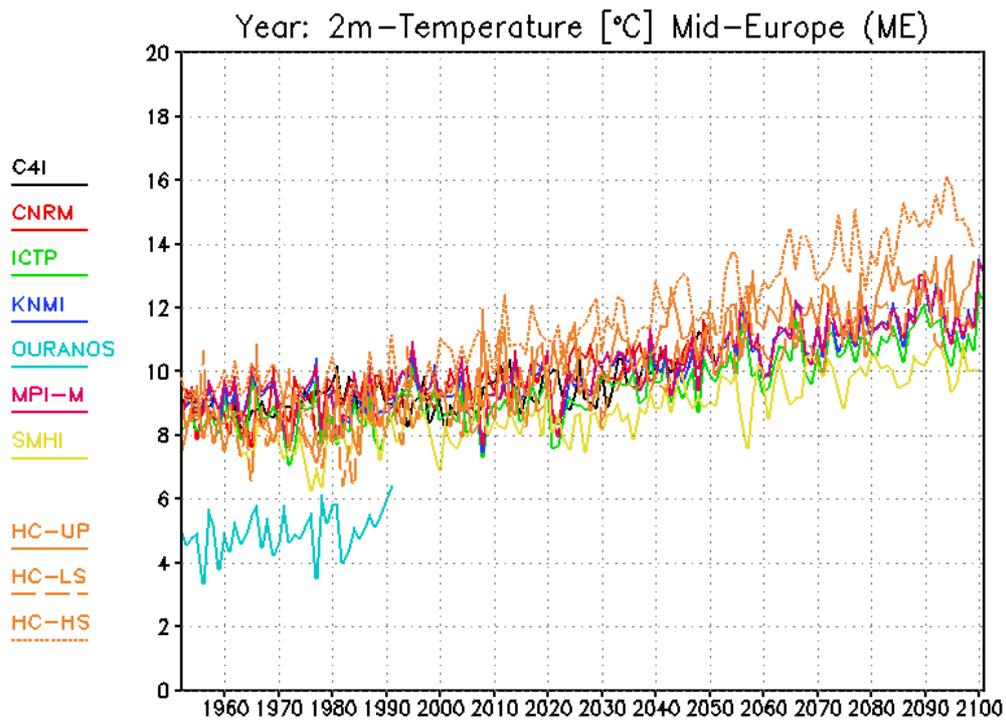


Fig. 2: Yearly mean 2m-temperature [°C] for PRUDENCE region 4 (Mid-Europe).

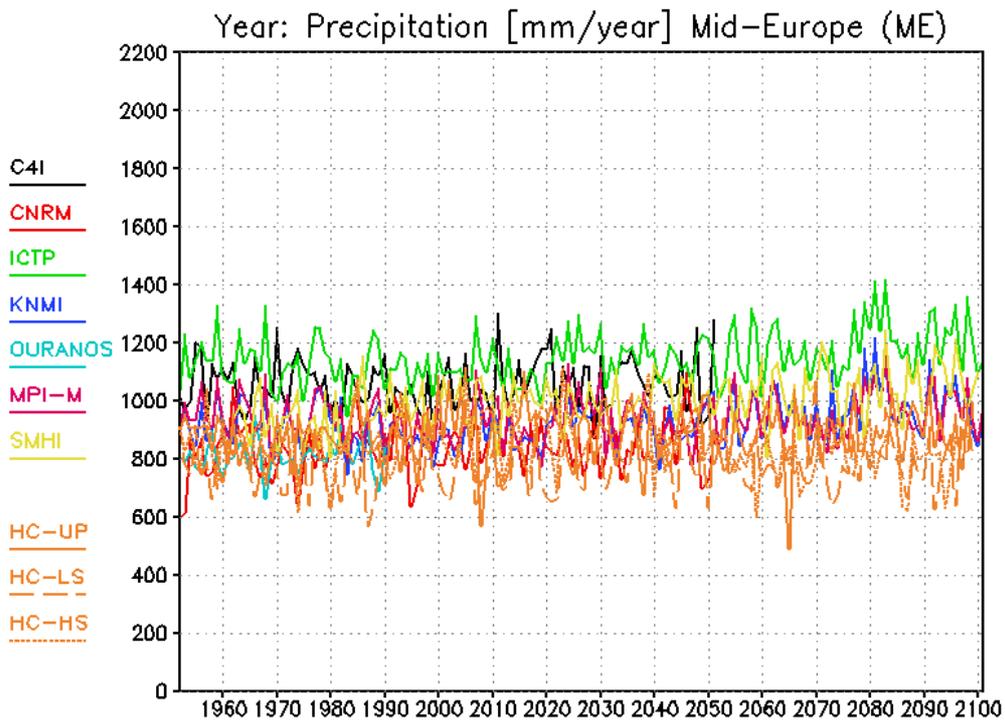


Fig. 3: Yearly precipitation sum [mm/year] for PRUDENCE region 4 (Mid-Europe).

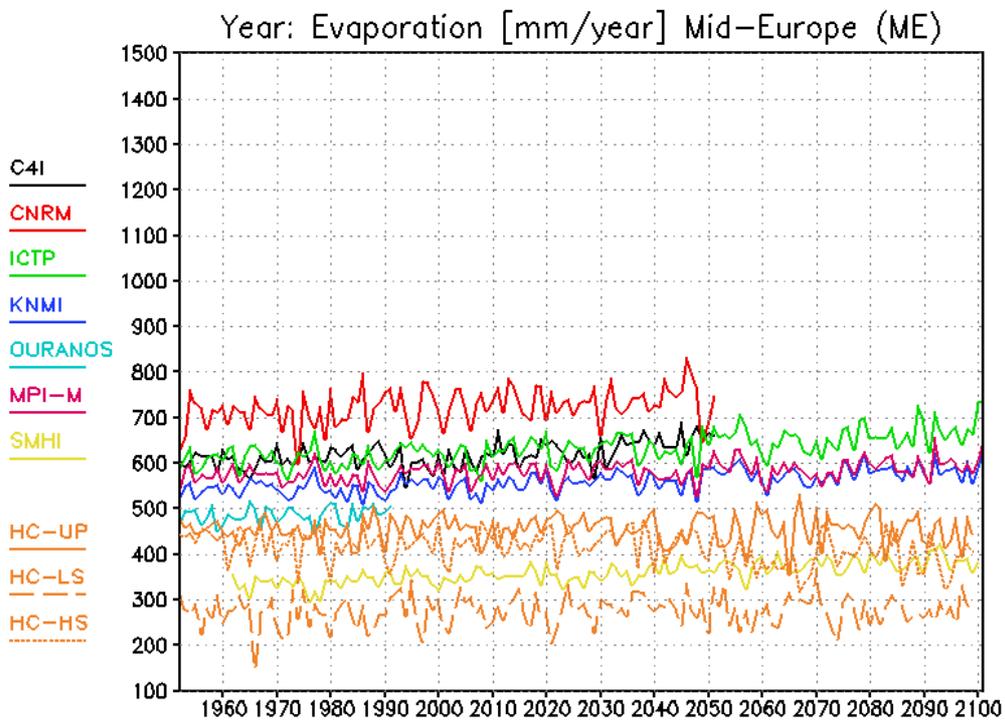


Fig. 4: Yearly evaporation sum [mm/year] for PRUDENCE region 4 (Mid-Europe).

Seasonal mean values (four seasons, example only for DJF)

For each simulated year, seasonal means (2m-temperature) and seasonal sums (precipitation, evaporation) have been computed for each analysis region. Figures containing these values for all RCMs have been produced for each season, each analysis variable and each analysis region (e.g., Figures 5-7).

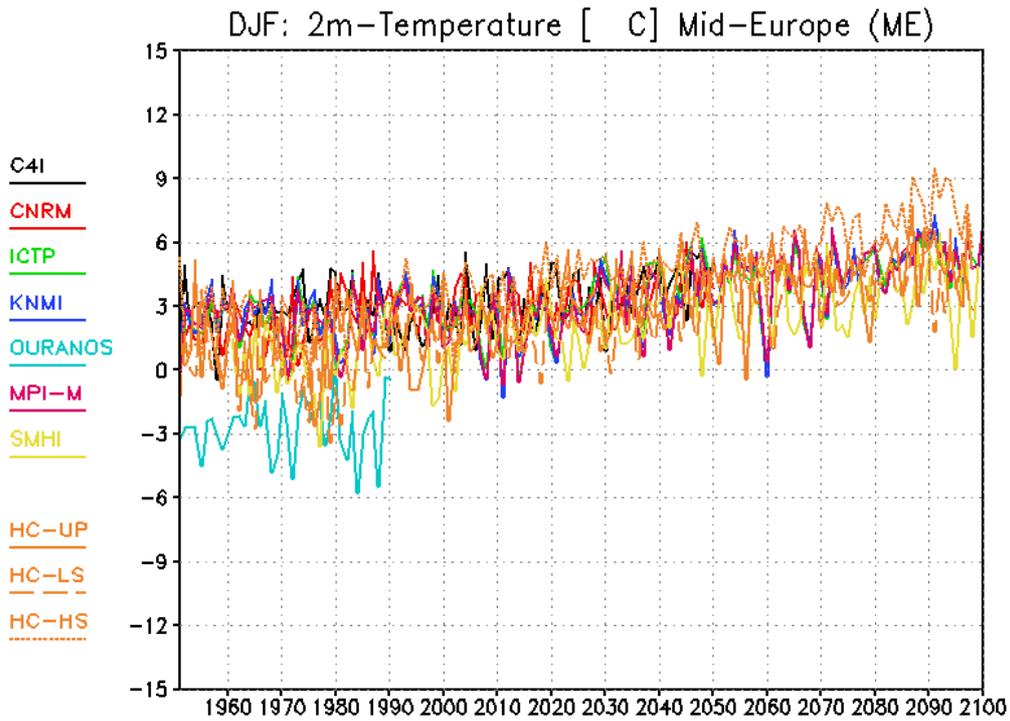


Fig. 5: Seasonal mean (DJF) 2m-temperature [$^{\circ}\text{C}$] for PRUDENCE region 4 (Mid-Europe).

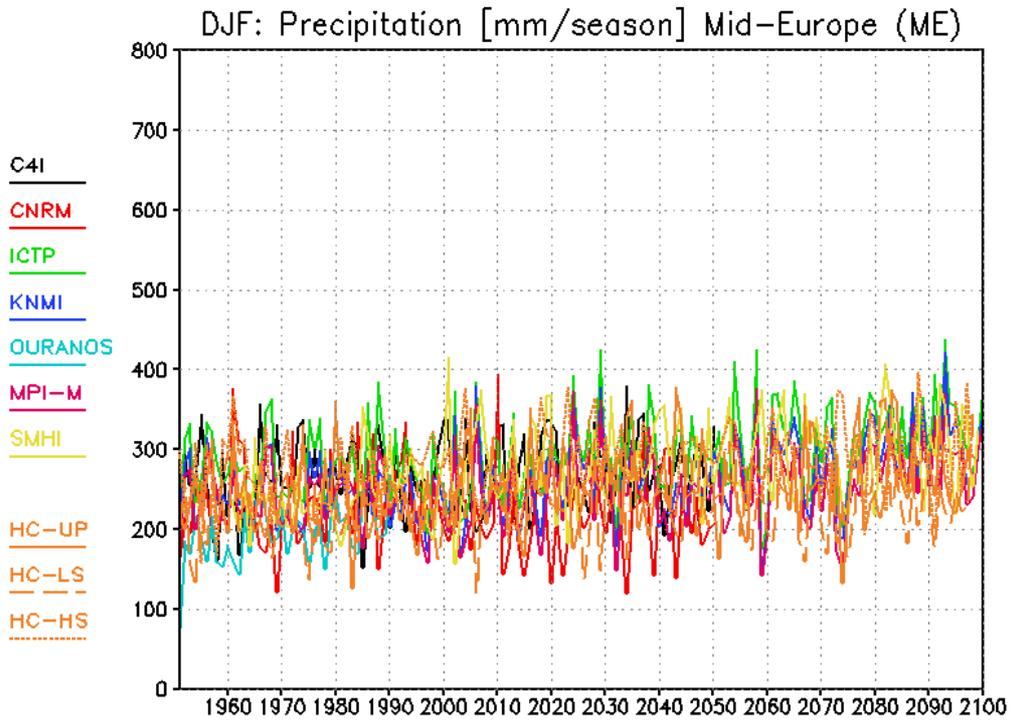


Fig. 6: Seasonal sum (DJF) precipitation [mm/season] for PRUDENCE region 4 (Mid-Europe).

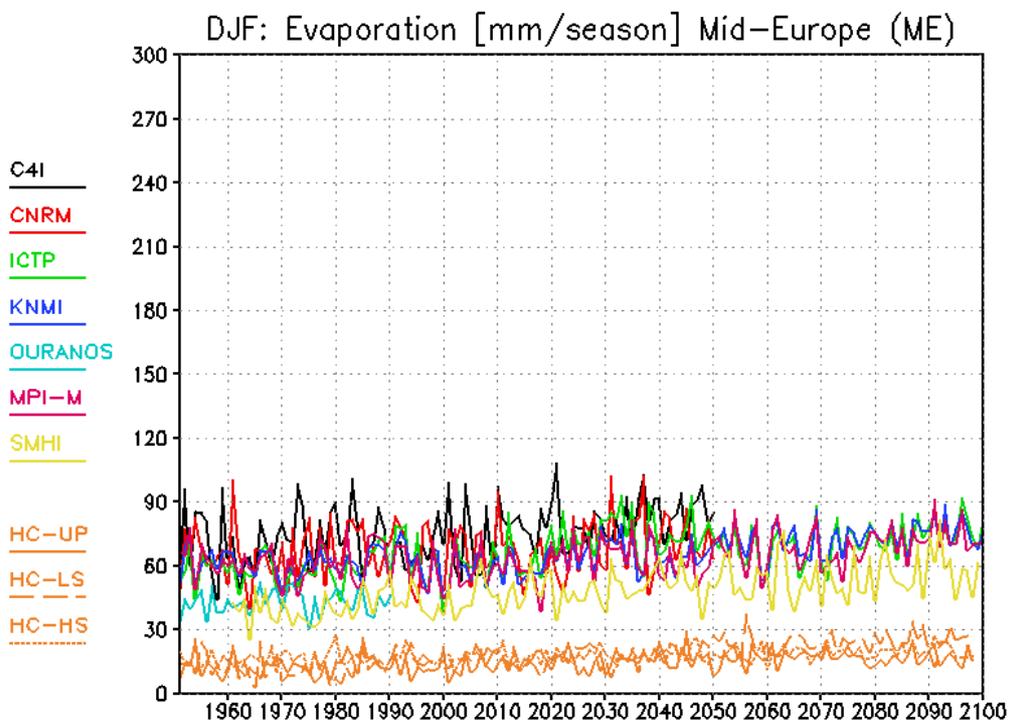


Fig. 7: Seasonal sum (DJF) evaporation [mm/season] for PRUDENCE region 4 (Mid-Europe).

Mean annual cycle for each decade

For each simulated decade, mean annual cycles have been computed for each analysis region on a monthly basis. Figures containing these values for all RCMs have been produced for each decade, each analysis variable and each analysis region (e.g., Figures 8-10).

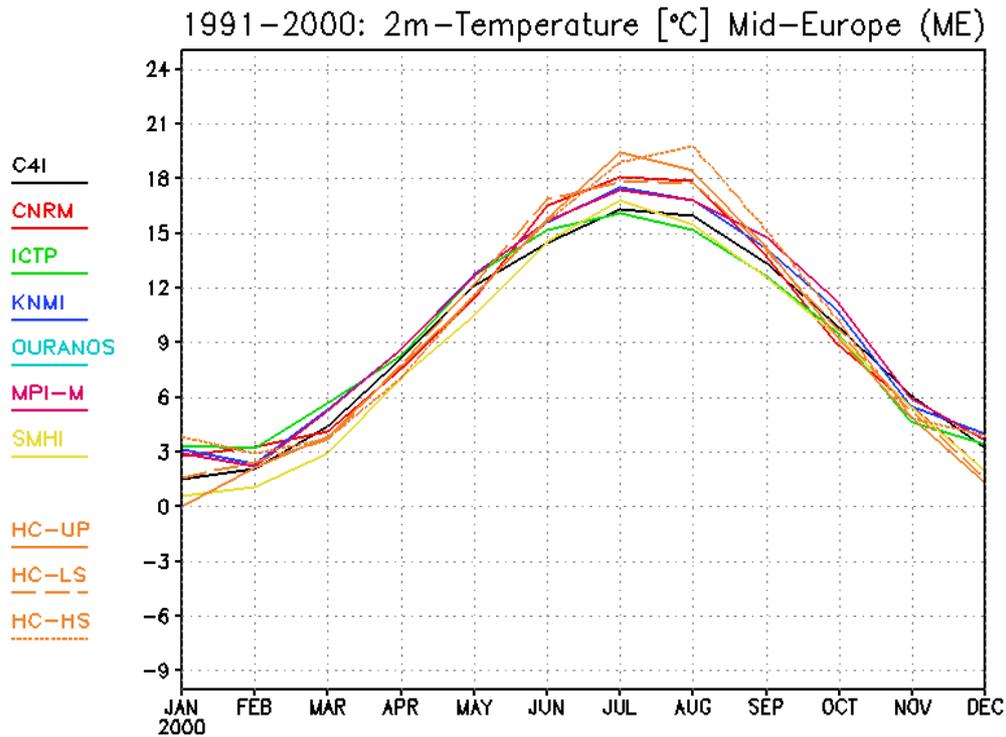


Fig. 8: Annual cycle of 2m-temperature [°C] for the decade 1991-2000 for PRUDENCE region 4 (Mid-Europe).

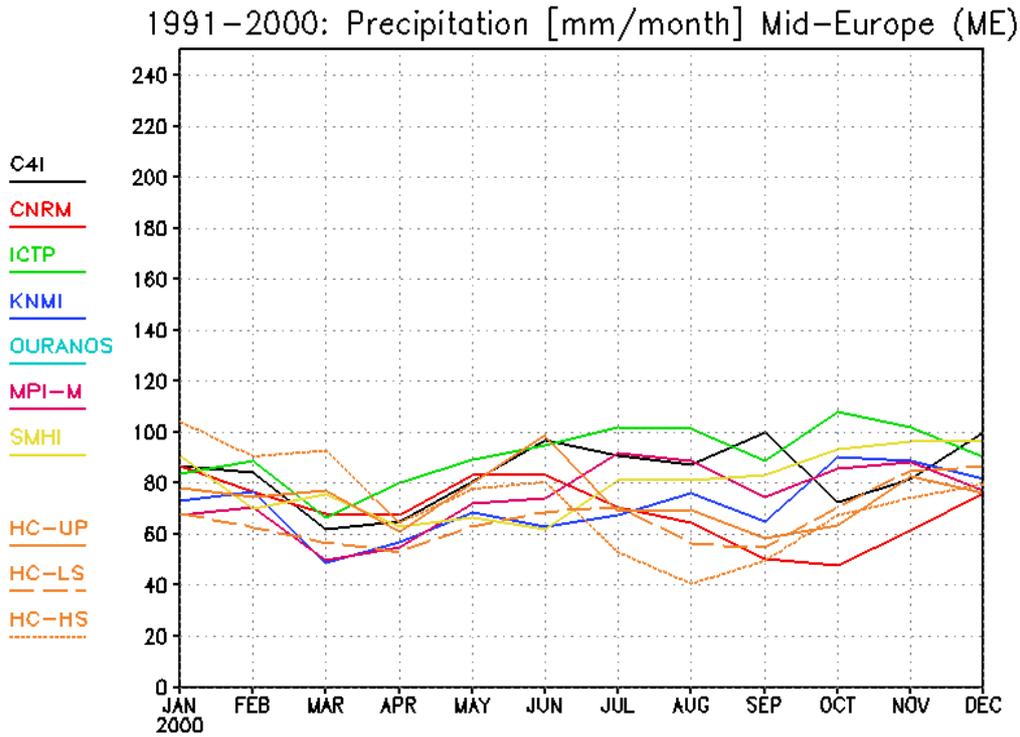


Fig. 9: Annual cycle of precipitation [mm/month] for the decade 1991-2000 for PRUDENCE region 4 (Mid-Europe).

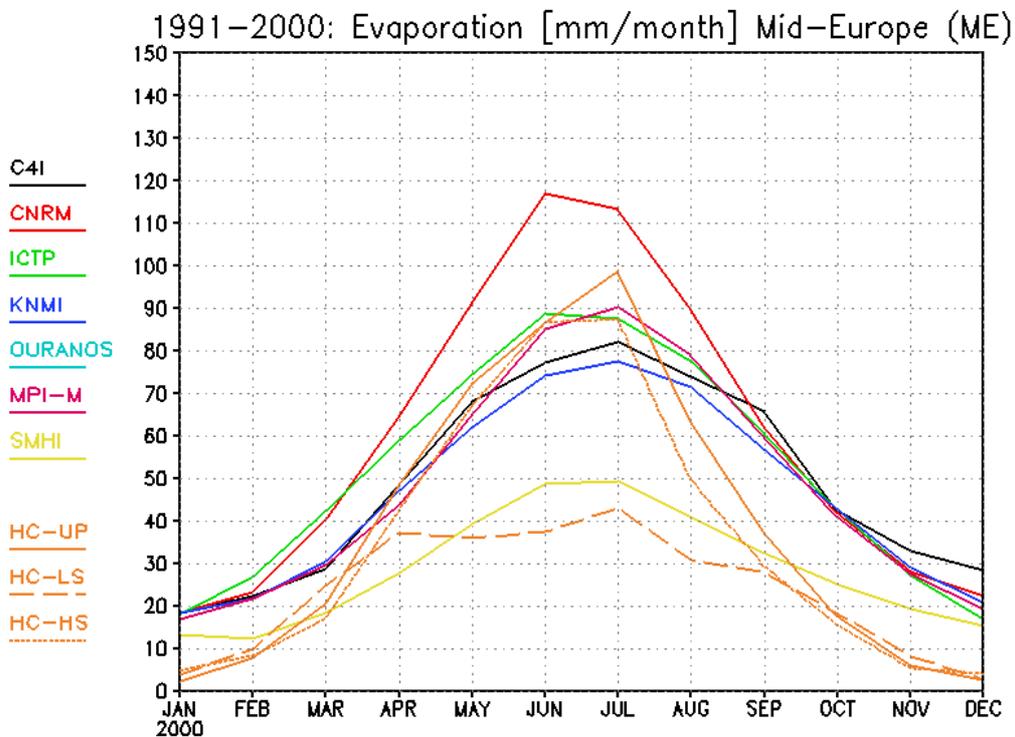


Fig. 10: Annual cycle of evaporation [mm/month] for the decade 1991-2000 for PRUDENCE region 4 (Mid-Europe).

Complete set of figures at ENSEMBLES webpage:

The complete set of all produced plots is available to all ENSEMBLES partners on the following web site: <http://ensemblesrt3.dmi.dk/private/quicklook/quicklook.html>. Figure 11 shows an example screenshot (yearly means of 2m-temperature). The figures will be updated regularly, as new model results become available.

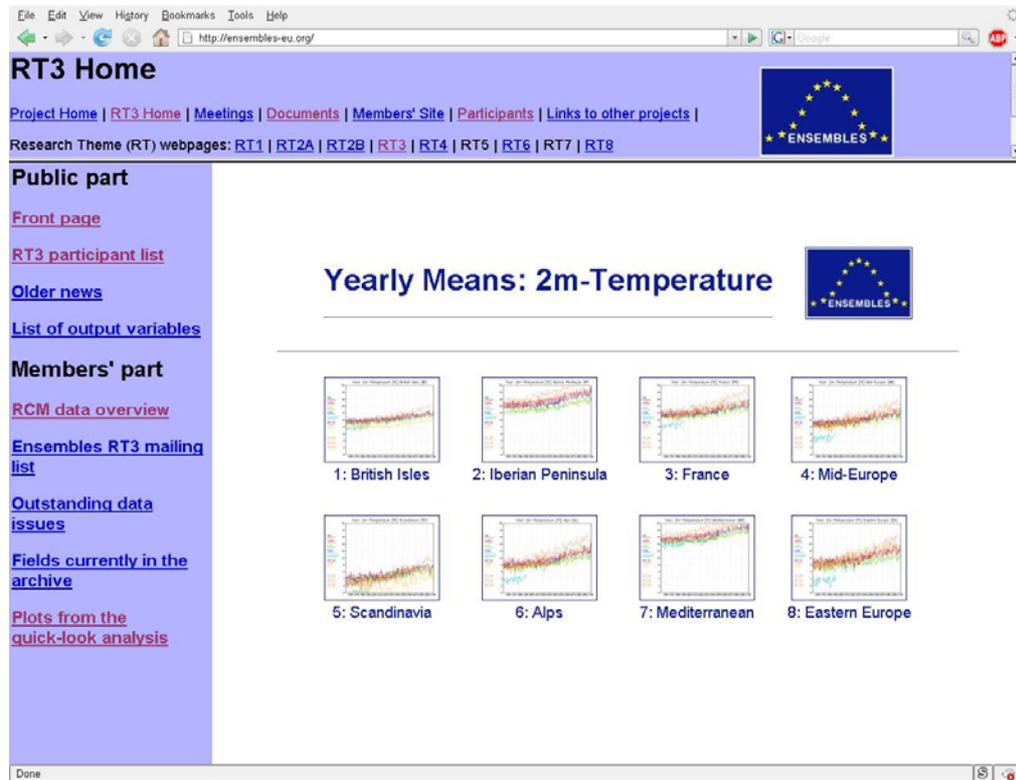


Fig. 11: Example screenshot of the Quick-Look results area on the password protected part of the ENSEMBLES webpage.

Given the preliminary nature of these results (see Overview and Objectives section), these figures will initially be available only from a password protected part of the ENSEMBLES webpage. It is the intention, however, to make these figures publicly available before the end of the project – at a time to be agreed by the RCM partners.

Extension of the Quick-Look analysis:

At the ENSEMBLES General Assembly 2007 in Prague it was decided to extend the quick-look analysis in the following way:

- The quick-look analysis originally has been done for the whole PRUDENCE areas, i.e. for the land and water part of each area together. The analysis will be extended now additionally for the land fraction and for the water fraction of each PRUDENCE area individually.
- Inclusion of the gridded dataset produced by RT5 for the land-only figures from 1950-2000 (2m-Temperature and precipitation)
- Inclusion of output from the associated GCMs.