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D2B.13   ERA-40 based predictor data set for statistical downscaling

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Partner 44 THE NATIONAL INSTITUTE OF METEOROLOGY OF SPAIN (INM)

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Dissemination Level		
PU	Public	PU
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)	

D2B.13   ERA-40 based predictor data set for statistical downscaling

The purpose of this report is to describe the common set of ERA40 variables included in the *data-access tool* of the *statistical downscaling portal* of RT2B developed by INM/UC. This data-access tool provides small subsets of reanalysis data (interpolated over specific locations, or over small subgrids). The number of variables which can be stored is constrained in size due to the reduced capacity of the local servers at the University of Cantabria (a maximum of 2 TB), so a somewhat reduced list of variables has been provided initially together with a protocol to dynamically include new variables required by other RT2B partners for statistical downscaling. Therefore, as the project proceeds, the number of variables accessible through the portal will be continuously incremented to satisfy as many as possible of the RT2B partner demands.

The domain shown in Figure 1 is used for the ERA40 predictor datasets and covers both the JRC gridded observations area http://agrifish.jrc.it/marsstat/default.htm (which is also available through the web downscaling portal) and the domain agreed by the RT3 dynamical downscaling partners. For this grid, ERA40 data are provided through the web portal at 1º latitude/longitude horizontal resolution (the original ERA40 data resolution is approximately 1.125º; see http://www.ecmwf.int/research/era/) with temporal resolution of six hours. The data-access tool also includes temporal aggregation functions to obtain averages on lower temporal resolutions (daily, monthly). The period of reanalysis data is from 01/09/1957 to 31/08/2002.

The user can select small sub-regions, variables and levels to download the data they require for analysis – either within or external to the downscaling web portal. The data can be obtained either as a text file, or a NetCDF file.
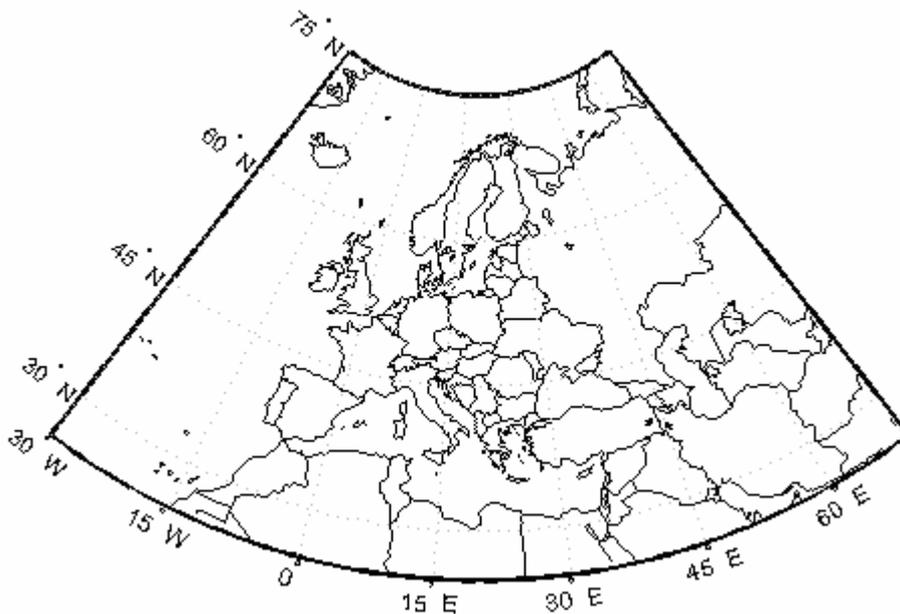

Figure 1. Lower left corner [30W / 25N]. Upper right corner [70E / 75N]. No. of grid points [101 / 51].

So far, the following ERA40 parameters (see http://www.ecmwf.int/research/era/Products/Archive_Plan/Archive_plan_3.html for a description of these parameters) have been included in the server:

Surface level parameters (Table 3.5 from ERA40 documentation link):

Name: mean sea level pressure Code: 151
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC

Name: 2 metre temperature Code: 151
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC

Name: Total column water Code: 136
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC

Upper air parameters on pressure levels (Table 3.3 from ERA40 documentation link):

Name: Geopotential Code: 129 Abrv: Z
Level: 1000mb, 850mb, 500mb, 200mb
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC

Name: Temperature Code: 130 Abrv: T
Level: 1000mb, 850mb, 500mb, 200mb
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC

Name: Specific humidity Code: 133 Abrv: Q
Level: 1000mb, 850mb, 500mb, 200mb
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC

Name: eastward wind component   Code: 131 Abrv: U
Level: 1000mb, 850mb, 500mb, 200mb
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC
Remarks: Derived from Vorticity and Divergence

Name: northward wind component   Code: 132 Abrv: V
Level: 1000mb, 850mb, 500mb, 200mb
Time: daily at 00UTC, 06UTC, 12UTC, 18UTC
Remarks: Derived from Vorticity and Divergence

Moreover, data for the above variables from the NCEP reanalysis have also been included, so the skill of downscaling performed with different reanalysis datasets can be compared.

These data are accessible through the RT2B *downscaling portal* by ENSEMBLES partners, using a special user and password to keep privacy of the information - http://www.meteo.unican.es/ensembles.

The initial set of parameters provided includes all those required for implementation of the statistical downscaling methods incorporated in the prototype downscaling portal (RT2B deliverable D2B.4) and also encompasses the majority of potential predictor variables identified in Table 2 of RT2B deliverable D2B.2. The need to incorporate additional variables, such as derived indices, will be investigated as part of work on D2B.17 – GCM based predictor data sets for statistical downscaling due at month 30. A questionnaire will, for example, be sent to RT2B partners in order to identify additional needs and to update D2B.2 Table 2. The intention is to make the most commonly-used predictor datasets centrally available. Where individual downscaling schemes use what might be considered as rather 'exotic' predictors, the RT2B partner concerned will be responsible for calculating the derived predictors themselves (though this may well be done using 'raw' ERA40 and/or GCM variables from the RT2B predictor data archives).