Issue in some CNRM-CM5 files and implications for CMIP5 and CORDEX users

Version: 21st February 2018
Contact: contact.cmip5@meteo.fr , contact.aladin-cordex@meteo.fr

MAIN MESSAGE:

An error has been detected in some files of the simulation « historical_r1i1p1 » of the CNRM-CM5 CMIP5 model. The atmosphere data at the 6-hourly frequency on the model level (6hLev) for the variables ps, ta, ua, va, hus do not come for the member r1i1p1. We therefore advise not to use them.

ADDITIONNAL INFORMATION FOR CORDEX AND RELATED USERS:

The erroneous files have been used widely as atmospheric lateral boundary conditions to drive Regional Climate Models in the CORDEX initiative. To be more concrete, the erroneous files come from another member of the same model ran in the same conditions. This other member is currently unknown in CMIP5 as not published and we will now call it here « historical_r11i1p1 ».

The other data of the simulation « historical_r1i1p1 » are however correct, in particular the data used to drive RCM: 6-hourly data on pressure level (6hPLev), the sea surface temperature and the sea ice cover.

The error is only in the historical_r1i1p1 run. The 6hLev files shared for the RCP scenario runs are correct and come from member r1. This means in particular that an atmospheric jump is expected at the historical-scenario transition in January 2006.

For the RCM forcing within CORDEX, the error means an inconsistency between the SST and SIC forcing (coming from member r1) and the atmosphere lateral boundary forcing (coming from member r11). This problem impacts all the HIST simulations of the CORDEX initiative carried out using the CNRM-CM5 forcing on model levels (6hLev), including the CNRM runs done with CNRM-ARPEGE52, CNRM-ALADIN52, CNRM-ALADIN53 and CNRM-RCSM4.

The members r1 and r11 are a priori identical at climatological scale, so the error is not detectable at climate scale (long-term mean, standard deviation, past trend or climate change signal). However, the error leads to a temporal decorrelation between the run CNRM-CM5_historical_r1i1p1 and the associated CORDEX runs.

The 6hLev data of member r1 were not stored and therefore can not be provided. Consequently, for the modelling groups wishing to run new CORDEX simulations driven by CNRM-CM5, we advise to keep the SST and SIC data from the member r1 and to use the pressure level data for the member r1 (6hPLev).

Concerning the existing CORDEX simulations including the erroneous driving data, we let each user decide if he wishes to continue using the CNRM-driven runs or to discard them.

The CNRM apologizes for this error that has many implications for the CORDEX community and thanks all those who have helped to detect it.