Wikiprint Book

Title: udg/ecoms/EndUserNeeds/NoteTimeAggregation

Subject: TracMeteo - udg/ecoms/EndUserNeeds/NoteTimeAggregation

Version: 8

Date: 05/19/2022 11:25:11 AM

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A major limitation exists in the direct use of climate models for the calculation of many CIIs. In particular, CIIs are often empirically-derived from weather observations and field/laboratory experimental work. As a result, the standard meteorological records needed to compute CIIs in standard conditions often correspond to very high temporal resolutions (sub-daily) or even instantaneous records that need to be measured at local standard time.

On the other hand, publicly available climate databases store variables as daily means (or maximum/minimum) in most of the cases, or as 6 hourly instantaneous values on a UTC temporal basis in the best situation. For instance, sub-daily variables generated for the different SPECS experiments are defined as ?Class 3, and thus they will be stored locally at the modelling centres and made available on request only. Notable examples of CIIs requiring instantaneous data for their determination are the Physiological Equivalent Temperature (PET) and the Fire Weather Index (FWI), widely used in the tourism and forestry sectors respectively, which have been identified as relevant indicators within EUPORIAS.

In order to bridge the gap between the end user's and the climate modeller's communities, it is necessary to achieve a consensus so that the requirements for CII computation are met by the climate model outputs. Ideally, this should entail the availability of some variables used as input for CIIs at the sub-daily scale when necessary (either 3 or 6-h should suffice to approximate local standard times). The use of inadequate data for CII computation may lead to problems seriously impairing the validity of the results in impact studies. This issue is analysed in detail for the particular case of the Canadian Fire Weather Index (FWI) by Herrera et al. (2013), which highlights the problems related to the use of daily averaged data for FWI calculation.

As an alternative, the use of proxy variables for the construction of CIIs could be also explored, although it is important to remark that this is always a sub-optimal solution that should be only considered when the required variables are by no means available. Furthermore, the use of adequate proxies always requires a prior assessment involving the availability of at least some control data. An example of the use of proxies for CII computation and their use for future climate impact assessment is given in the regional projections of fire danger for Europe by Bedia et al. 2013, using the FWI system.

Refs:

S Herrera, J Bedia, JM Gutiérrez, J Fernández, JM Moreno (2013) On the projection of future fire danger conditions with various instantaneous/mean-daily data sources. Climatic change 118 (3-4), 827-840

J Bedia, S Herrera, D San Martín, N Koutsias, JM Gutiérrez (2013) Robust projections of Fire Weather Index in the Mediterranean using statistical downscaling. Climatic change 120 (1-2), 229-247