



Computation of daily evapotranspiration to support the estimation of the surface energy budget in the Carpathian Region

Monika Lakatos (1), Tamás Weidinger (2), Lilla Hoffmann (1), Ákos Horváth (1), Zita Bihari (1), and Tamás Szentimrey (3)

(1) Hungarian Meteorological Service, Climate Division, Budapest, Hungary (lakatos.m@met.hu), (2) Department of Meteorology, Eötvös Loránd University, (3) Varimax Limited Partnership

The almost closed structure of the Pannonian Basin in the heart of the European continent makes it a good natural laboratory for the studying of the water and energy cycles, focusing on the physical processes of relevance. This is the area of interest for PannEx (Pannonian Basin Experiment) which is a newly initiated Regional Hydroclimate Project (RHP) of the GEWEX.

Meteorological dataset of in-situ homogenized, harmonized and gridded daily meteorological observations are available for PannEx region as a part of the CarpatClim database in the period of 1961-2010. The CarpatClim dataset includes gridded daily minimum, mean and maximum temperature, precipitation, wind direction and speed, sunshine duration, cloud cover, global radiation, relative humidity, vapour pressure, air pressure and snow depth data for 10 km spatial resolution grid. Climatological grids cover the area between latitudes 44°N and 50°N, and longitudes 17°E and 27°E. (<http://www.carpatclim-eu.org>)

The radiation balance (short- and longwave) and surface energy budget components (net radiation, heat into the soil, sensible and latent heat flux) are missing above different types of surface and land cover in daily or finer time scale. The gridded land cover and albedo series are also not available at the moment for the PannEx region. Long term coherent soil moisture dataset is also missing in the PannEx. One of the our main goals in the PannEx initiative to develop and verify a unified methodology for gridded energy budget and soil moisture dataset based on the standard meteorological measurements and satellite information using different SVAT model approach for the CarpatClim grid system in the Pannonian Basin.

As a first results in the PannEx initiative the computation of the Penman-Monteith evapotranspiration on daily scale were performed for the CarpatClim grid. The daily evapotranspiration grids can be integrated to the CarpatClim dataset and it can be used for other applications in the future. The structure of the derived dataset, applied methodologies and the first results are presented in this study. The comparison of the monthly PET values available for the CarpatClim area and the monthly values derived from the daily Penman-Monteith estimation will be introduced. The modelled daily evapotranspiration by WRF model will be compared to the gridded data for three regions specified in the area of PannEx as a case study for a severe drought period occurred in the summer of 2007.