Evaluation of the possible changes in diurnal temperature range (DTR) trend in some arid climates of Iran since last five decades

A A Sabziparvar, R Mirgaloybayat and F Ghyami Shamami
Department of Irrigation, Bu-Ali Sina University, Hamedan, Iran
E-mail: swabzi@basu.ac.ir

(Received 24 June 2010 ; in final form 23 December 2010)

Abstract
Climate is an important and determining factor affecting many agricultural products. Diurnal temperature range (DTR) is an effective parameter in assessing climate change impacts on environment in a region. This parameter is determined by the difference between minimum and maximum air temperatures. In this study, changes in the daily DTR collected from 11 synoptic stations were analyzed. The selected sites cover 50 years of daily observations from 1956 to 2005, specifying suitable geographical distribution throughout the country. Kolmogrov-Smirnov test was used to check the normal distribution and Run-test to control the quality of the temperature data. Trend investigation of DTR data was carried out by using Mann-Kendall test (MK) and linear regression method (LR) at 95 percent confidence level for monthly and annual time scales. About 18 percent of the study sites showed no significant DTR trend, but the rest of the sites (82%) revealed significant negative (decreasing) trends for the observed diurnal temperature difference time series. However, few months experienced no DTR trend in the selected sites. In about 95.5 percent of the studies cases, the existence of trend and the decreasing DTR trends obtained by MK test were also confirmed by the LR method. In this research, the minimum and maximum slopes were determined by the LR method. The analysis of the measured temperature data showed an average decreasing in DTR slope about -0.445°C per decade for the selected sites. According to the results, the decreasing DTR trends in northern and central sites were more significant than those in the southern regions. Detailed evaluation and substantiation.

Keywords: diurnal temperature range, trend, Mann-Kendall test, linear regression

For full article, refer to the Persian section.