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This article is from the Spring 2006 issue of Update

CIMIS data quality control revisited: temperature and relative humidity

 [Spring 2006](#)

In the winter 2005-06 issue of Update, we presented methods that CIMIS uses to conduct the quality control (QC) of one of the most important weather parameters, solar radiation.

We indicated that we will present QC methods for other weather parameters in the future issues. This article is, therefore, a continuation of the previous discussion and describes methods that CIMIS uses to QC air temperature, soil temperature, and relative humidity. Unlike solar radiation, there are no maximum limits for these parameters against which measured values can be compared. That is why we always hear about record high or low temperatures from our local newscasts.

CIMIS uses statistical methods, based on means and standard deviations of historical data, to QC air temperature, soil temperature, and relative humidity. Statistical quality controls require that the data to be evaluated has a normal probability density function.

CIMIS has determined through research that these weather parameters indeed have normal probability density functions, and therefore statistical methods are appropriate. The statistical methods are used to develop a set of QC criteria for the purpose of identifying data that fall outside of the control limits. The control limits are set using the mean and standard deviations of historical data. A minimum of 5 years of historical data is required by CIMIS for this purpose.

Monthly means and standard deviations are calculated for each hour of the day, for the hourly QC, and for each day of the month, for the daily QC. Then, an upper control limit (UCL) and a lower control limit (LCL) are established from the means and standard deviations for each weather parameter.

Depending on where each hourly or daily measured data falls, different flags are assigned. For example, the flag R is used if the data is over 3 standard deviations from the mean, and Y is used if the data is within 2-3 standard deviations from the mean. Other flags are also used to specify different scenarios.

More information on the flags that are currently used can be obtained by visiting the CIMIS web site. It should be noted, however, that flagging data does not necessarily mean it is erroneous, as it can simply be an artifact of an extreme weather condition.

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