

CIMIS Data Quality Control Procedures and Uses (July, 2003)

The California Irrigation Management Information System (CIMIS) collects weather data from all over California using pyranometers, anemometers, wind vanes, rain gauges, and temperature and relative humidity sensors. Some of these measured weather parameters are used to estimate reference evapotranspiration (ET_o). ET_o and the weather parameters are used for planning, design, and management of irrigation systems and many other applications statewide. Therefore, it is essential that the data be as accurate as possible.

CIMIS has developed a stringent quality control (QC) criterion to help its users identify potential data quality problems. Problems with CIMIS data quality can be due to sensor malfunction, sensor deterioration, unexpected obstruction of sensors, abnormal weather, and communication problems between the datalogger and the central computer. Missing and questionable data are flagged by the CIMIS QC.

Although flagging is automatic, it is regularly monitored by the CIMIS staff. If a data is missing because of sensor malfunction or communication problem, corrective measures are taken as soon as it is practical. Such measures include replacing problematic sensors and repopulating the data by downloading from the datalogger, when possible.

However, there are circumstances where the weather data is available but of questionable quality. CIMIS utilizes statistical and scientific tools to identify such data. Once identified, the data is flagged and stored in the CIMIS database. Users make their own decisions regarding whether to use the flagged data or not. It should be noted that flagging a data does not necessarily imply erroneous data as it can very well be because of extreme weather conditions. However, determining whether the data is flagged due to sensor problem or extreme weather phenomenon is not an easy task. The following simple steps can help users make such decisions:

- Check whether the data for related sensors at the same station are also flagged. For example, an increase in solar radiation at the surface usually increases air temperature. Therefore, if solar radiation is flagged as "extremely out of range", it is likely that air temperature has either been flagged or has significantly increased for that time period.
- Compare the flagged data from the station with nearby stations that have similar microclimates. Although some weather parameters can vary within short distances depending on weather, others remain similar over large areas.
- Contact CIMIS staff.