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Calibration of Weather Station Instruments and Heat Island Effects

The Optical Remote Sensor Laboratory Montana State University operates two weather stations, one on the roof of Cobleigh Hall, and the other in an agricultural field west of campus. In recent years, temperature readings received from these two weather stations have shown a small but significant bias. This project sought to determine how much of this difference is caused by calibration uncertainties and how much might be caused by a “heat island effect.” First, the relative calibration between the temperature and humidity probes of each station was determined using a common reference probe, after which the reference probe was sent to a factory for recalibration. Secondly, the absolute calibration for each station was determined with the newly calibrated probe. Thirdly, the common reference sensor and a GPS were mounted on a backpack frame and data was collected throughout the campus and the vicinity so that a map of the magnitude and spatial extent of a heat island could be plotted on a satellite image. The presentation will describe the experiment and show results of the data, which currently are being processed.