SURFACE RADIATION OBSERVATIONS FOR OCTOBER 27-28, 1986 DURING THE WISCONSIN FIRE/SRB EXPERIMENT

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The purpose of this paper is to present a portion of both the shortwave and longwave surface radiation data measured during the combined FIRE (First ISCCP Regional Experiment) and SRB (Surface Radiation Budget) experiments conducted in central Wisconsin from October 14 to November 2, 1988. Figures 1 and 2 summarize the time periods from which high quality measurement values were obtained. Data gaps exist because of either equipment malfunctions or electrical power failures. Intercomparison of pre-experiment measurements by the various organizations involved suggests that all stations are accurate (relative to each other) to within about 10 W/m^{-2} on a 24-hour daily average basis. Most of the instruments were calibrated by the National Radiation Centers in either the U.S. (National Oceanic and Atmospheric Administration) or Canada (Atmospheric Environment Service).

October 27-28, 1986 have been selected for detailed case study because a large amount of cirrus clouds existed over the experiment region on those days. Figures 3 and 4 show downwelled irradiance values at each surface station at the times of afternoon NOAA-9 overpasses. Unfortunately, October 27th was a day in which a number of the sites experienced unexpected problems. Values shown are 10-minute averages centered about each overpass time, but minute-average data are available. Similar data will be presented for both GOES and Landsat overpasses. In addition, time histories of each site will be available for synchronization with aircraft overpasses which occurred during those two days. Downwelled shortwave irradiance values will be correlated with narrow-band cloud optical depth values from Ft. McCoy in order to determine if there is a reasonable quantitative relationship between Eppley-measured surface shortwave irradiance and cirrus cloud optical depth.

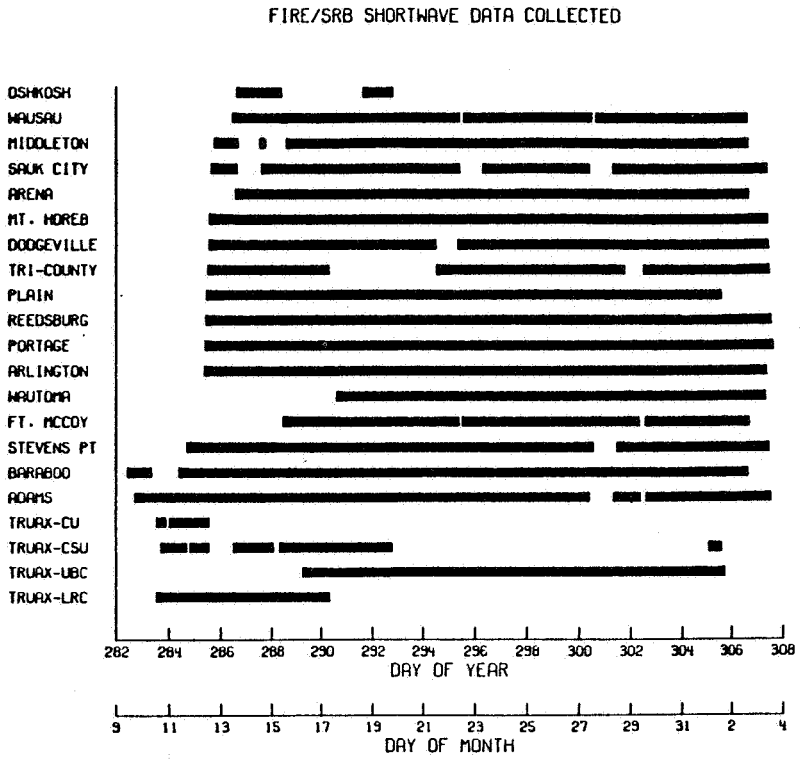


Figure 1. Wisconsin FIRE/SRB shortwave data periods.

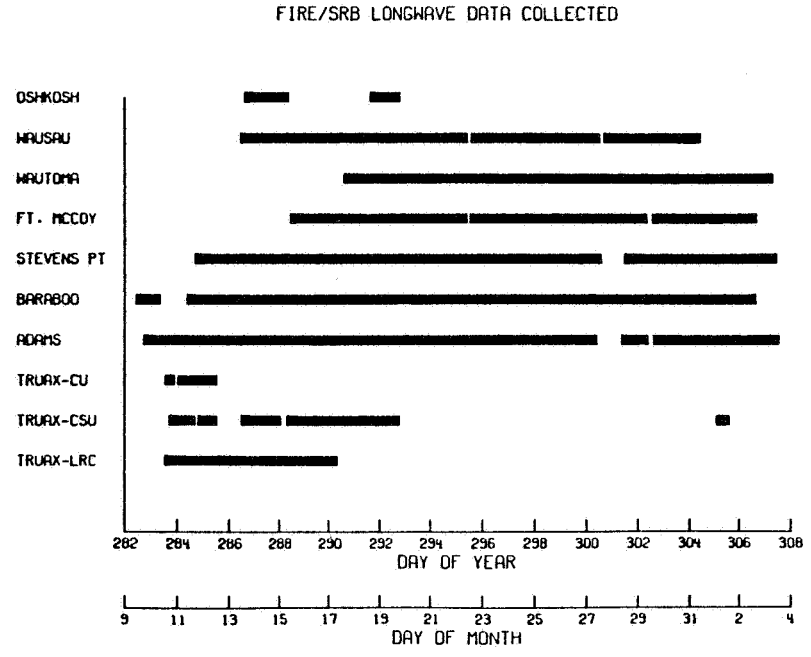
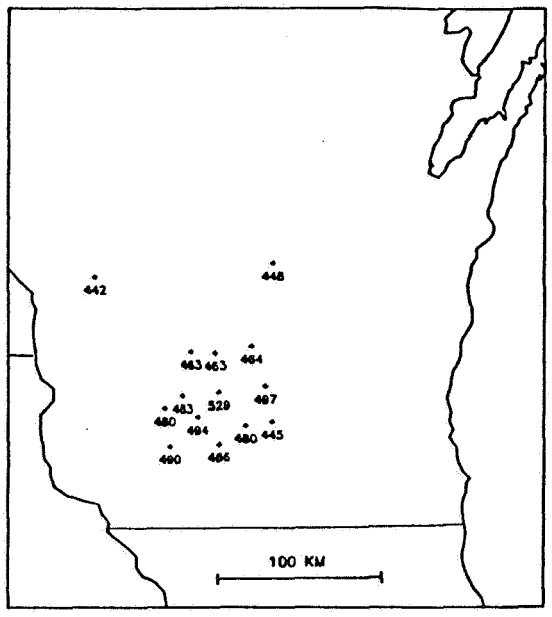
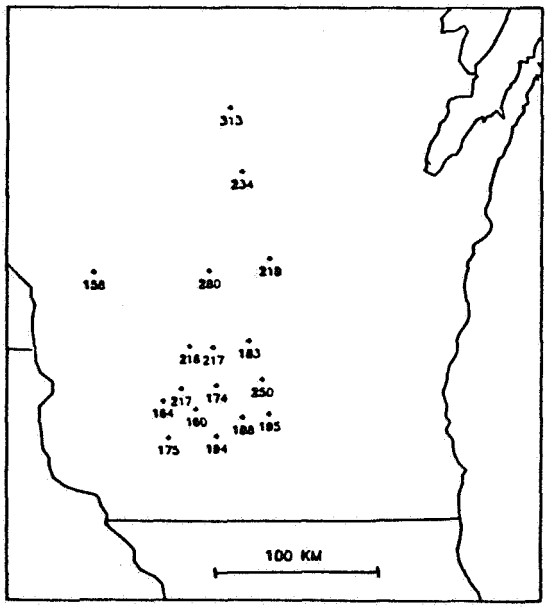


Figure 2. Wisconsin FIRE/SRB longwave data periods.

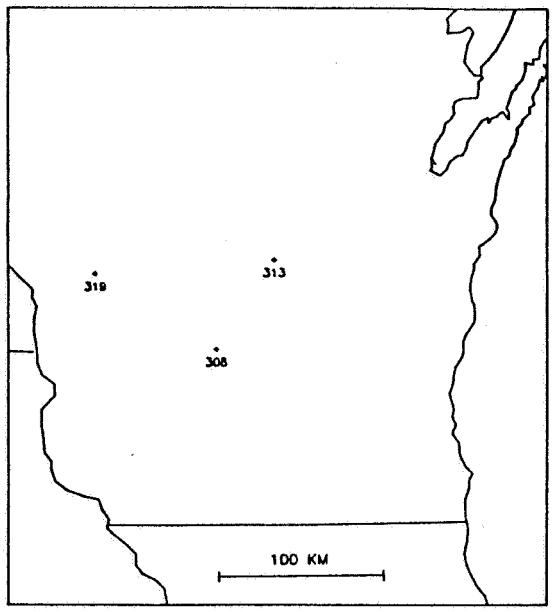


(a) October 27, 1986.

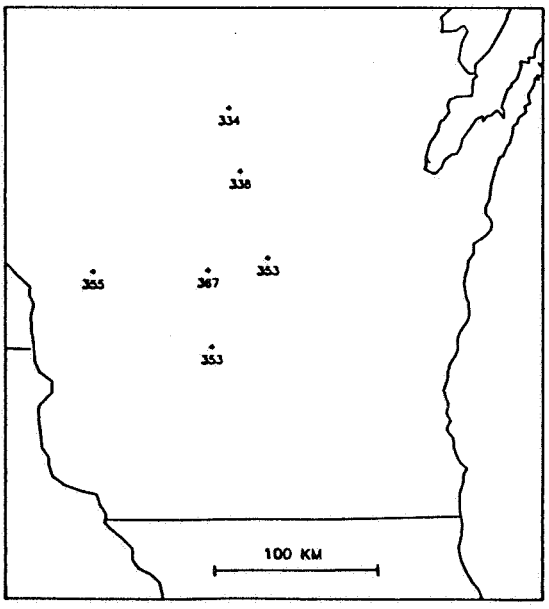


(b) October 28, 1986.

Figure 3. Downwelled shortwave surface irradiance (W/m^2) at time of afternoon NOAA-9 overpass.



(a) October 27, 1986.



(b) October 28, 1986.

Figure 4. Downwelled longwave surface irradiance (W/m^2) at time of afternoon NOAA-9 overpass.