

NOAA Ground-Based Surface Radiation Measurements for Research: A New Era

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The CMDL Solar and Terrestrial Atmospheric Radiation (STAR) group and the Air Resources Surface Radiation Research Branch (SRRB) group will begin functioning as a single entity within the Global Monitoring Division of the soon to be formed NOAA Environmental Science Research Laboratory. This new group will provide monitoring data to address diverse needs and interests in climate change, air quality, weather, agriculture, energy supply, and ecosystems. These expanded roles for the new Radiation Group follow an increased awareness of, and appreciation for, observed surface radiation data for studying atmospheric processes. Notably, in recent years, there have been several examples of enhanced performance of weather and climate models through use of high-quality, high-resolution surface radiation data. These data are also now being used to validate data from a number of satellite programs. Ground-based radiation records of greater than 25 years in duration from the radiation groups are now capable of demonstrating aspects of climate variability that have not previously been recognized. One such recent atmospheric/climate change observation is a downward trend in the observed total solar radiation measured at the NOAA CMDL Barrow, Alaska, Atmospheric Baseline Observatory as shown in Figure 1. This trend is related to increased cloud frequency and optical thickness possibly due to changing atmospheric circulation in the Arctic Basin.

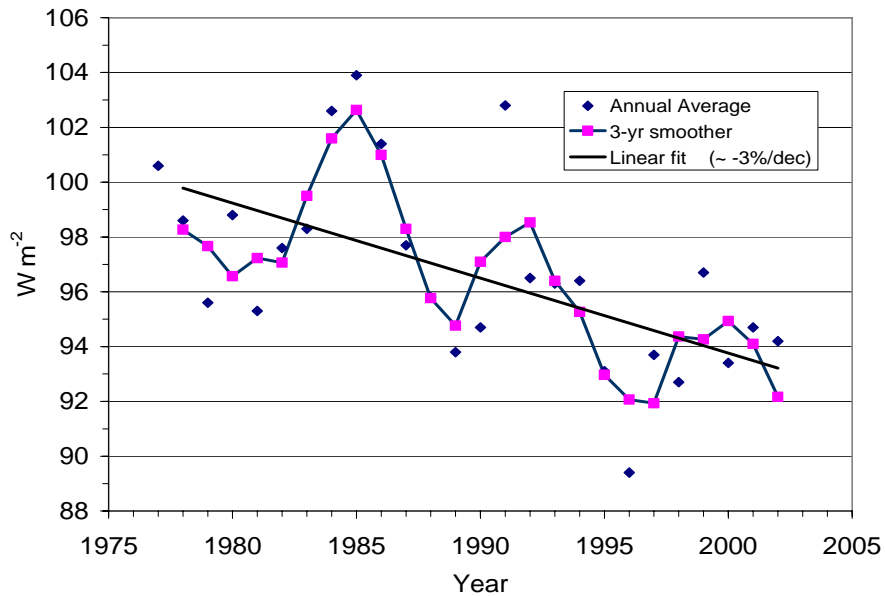


Figure 1 Smoothed annual average total solar radiation at Point Barrow, Alaska. The smoothed fit shows a significant, local, downward trend.