



**AVERAGE SOLAR RADIATION AND WIND INFORMATION FOR NORTH CAROLINA**

Katharine B. Perry, Professor and Department Extension Leader

**Solar radiation** provides the energy to warm our atmosphere and allow plant growth and animal life to exist on earth. The amount of "possible solar radiation" does not depend on the weather and is constant for a given date from year to year. The variation in "possible solar radiation" by date throughout the year is due to the earth's axis of rotation, which affects the hours of daylight and the angle (directness) of the sun's rays. The amount actually received, however, does vary, mainly due to the variation in amount of cloudiness.

On the average, the sun shines for about 70 percent of the daylight hours in spring and autumn, slightly less in summer, and about 50 percent in winter. The reduced amount in winter is due to more widespread areas of cloudiness which cover the state for longer period times.

The average daily solar radiation does not vary much across the state or the southeast United States (Table 1).

**Wind** - The wind direction at any time depends on the position of high and low pressure systems with respect to our state. Throughout the year the wind blows from the southwest more than any other direction. The months which are exceptions to this are September and October, when the prevailing wind is from the northeast. This is caused by prevailing high pressure north and northwest of the state and the frequency of low pressure storms off the coast increases.

Wind speed varies considerably, but generally averages 13 miles per hour on the Outer Banks, 10 miles per hour on the coast of the mainland, and 7 to 8 miles per hour over the inland sections of the state.

On a daily basis, wind speed typically diminishes at night reaching its lowest speed near daybreak, then increases through the day to a maximum in the middle of the afternoon.

Table 1. Average daily solar radiation for North Carolina and the southeast United States. Data period is 1952-1975.

Month	North Carolina <sup>y</sup> (langleys*/day)	Southeast U.S. <sup>z</sup> (langleys*/day)
January	195	200
February	265	275
March	355	350
April	460	475
May	500	550
June	520	550
July	495	550
August	460	500
September	385	425
October	320	325
November	235	250
December	180	200

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\* langley = calorie/cm<sup>2</sup>; Watts/m<sup>2</sup> = (langleys/day)/(2.066)

<sup>y</sup>From Epperson, D. L., G. L. Johnson, J. M. Davis and P. J. Robinson. 1988. Weather and climate in North Carolina. Agric. Extension Service, AG-375, North Carolina State University, Raleigh, pg. 31.

<sup>z</sup>From Reifsnyder, W. E. and H. W. Lull. 1965. Radiant energy in relation to forests. Tech. Bull. No. 1344, U.S. Dept. of Agric., Forest Service, Washington, D.C., pg. 27.

