

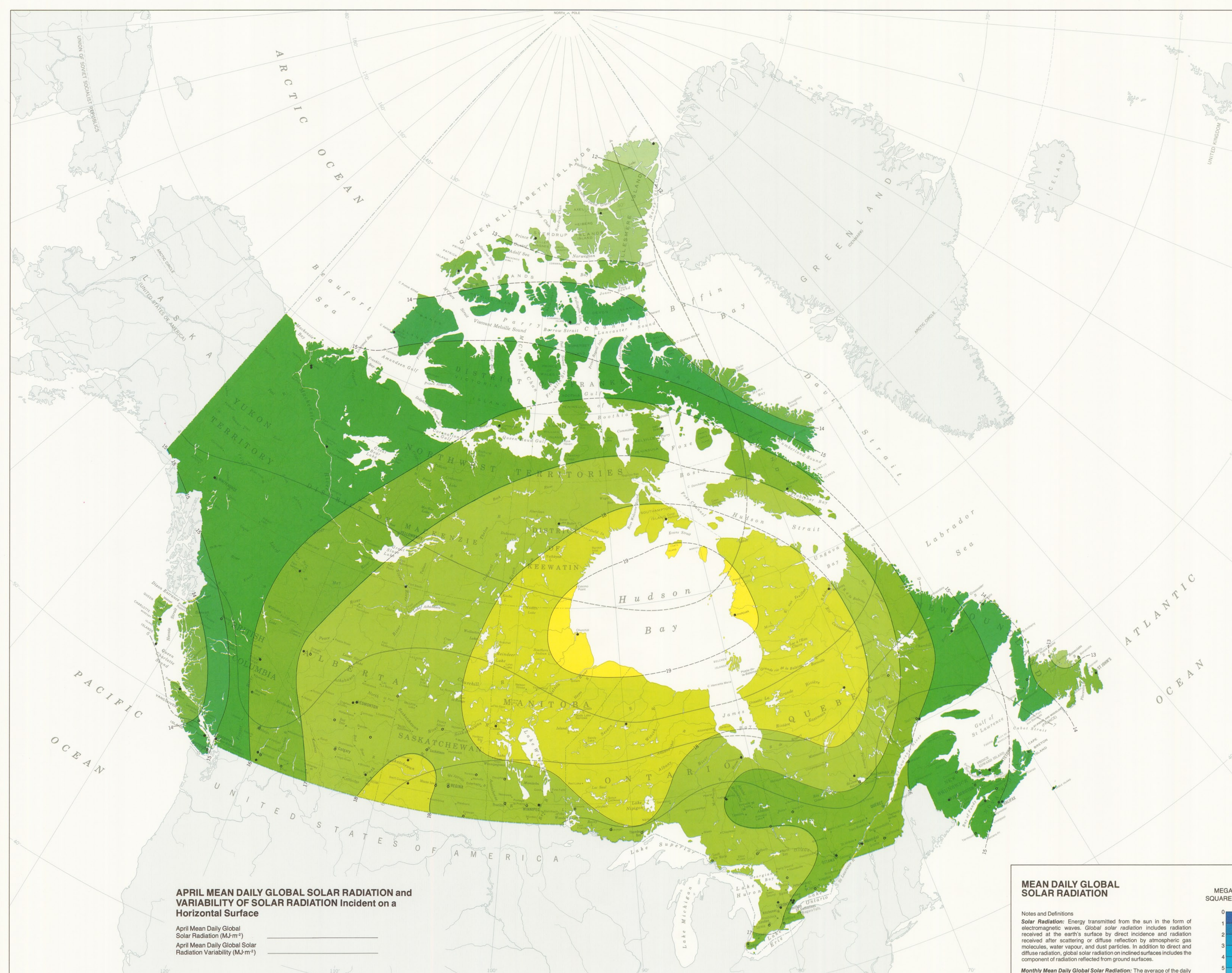
CANADA

SOLAR RADIATION- APRIL AND OCTOBER

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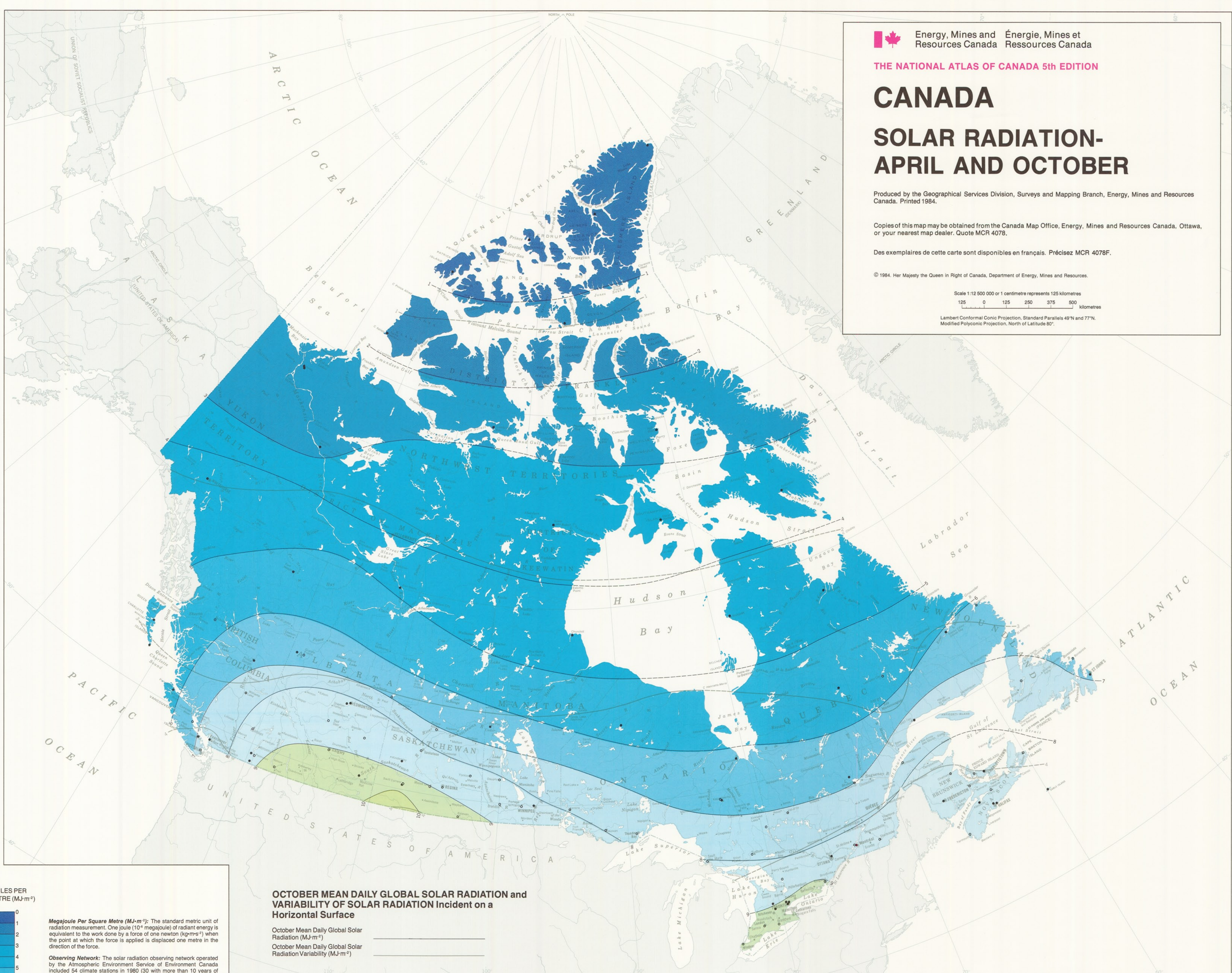
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 Scale 1:12,500,000 or 1 centimetre represents 125 kilometres
 1:50 0 100 200 300 400 500 600 700 800 900 1000
 Lambert Conformal Conic Projection, Standard Parallels 49°N and 77°N, Meridian Longitude Projection, North of Latitude 80°N



APRIL MEAN DAILY GLOBAL SOLAR RADIATION and VARIABILITY OF SOLAR RADIATION Incident on a Horizontal Surface

April Mean Daily Global Solar Radiation (MJ m⁻²)
 April Mean Daily Global Solar Radiation Variability (MJ m⁻²)



OCTOBER MEAN DAILY GLOBAL SOLAR RADIATION and VARIABILITY OF SOLAR RADIATION Incident on a Horizontal Surface

October Mean Daily Global Solar Radiation (MJ m⁻²)
 October Mean Daily Global Solar Radiation Variability (MJ m⁻²)

MEAN DAILY GLOBAL SOLAR RADIATION

Notes and Definitions

Solar Radiation: Energy transmitted from the sun in the form of electromagnetic waves. Global solar radiation includes radiation received at the earth's surface by direct incidence and radiation received at the earth's surface by reflection from atmospheric gas molecules, water vapour, and dust particles. In addition to direct and diffuse radiation, global solar radiation on inclined surfaces includes the component of radiation reflected from ground surfaces.

Monthly Mean Daily Global Solar Radiation: The average of the daily global solar radiation values for the month. The months of April and October have been selected as representatives of spring and autumn, respectively.

Variability: The seasonal variation of solar radiation received on the earth's surface is influenced significantly by four factors: the declination of the sun, the length of day, cloudiness, and ground cover. In the northern hemisphere, the sun reaches its maximum declination of 23°26'30" N (Tropic of Cancer) at the summer solstice (June 21-22) and minimum declination of 23°26'30" S (Tropic of Capricorn) at the winter solstice (December 21-22). Solar radiation received on a horizontal surface varies accordingly, with values being highest at the time of maximum declination and lowest at the time of minimum declination. The changing declination of the sun is an annual event which governs the length of day and the amount of solar radiation received on the earth's surface. The length of day varies throughout the year. The amount of solar radiation received on the earth's surface is also influenced by cloud cover and ground cover. In Canada, particularly in the north, estimates are needed for the months of June and December when up to 24 hours of daylight or darkness occur.

Inclined Surfaces: Data for solar radiation incident on inclined surfaces have been derived from measured and simulated horizontal radiation data using a horizontal model. Inclined surfaces of 60° and 90° with a south orientation were selected to illustrate the effect of surface orientation on solar radiation. 60° data are applicable to active solar energy systems. 90° data are relevant to passive energy systems that use solar radiation directly.

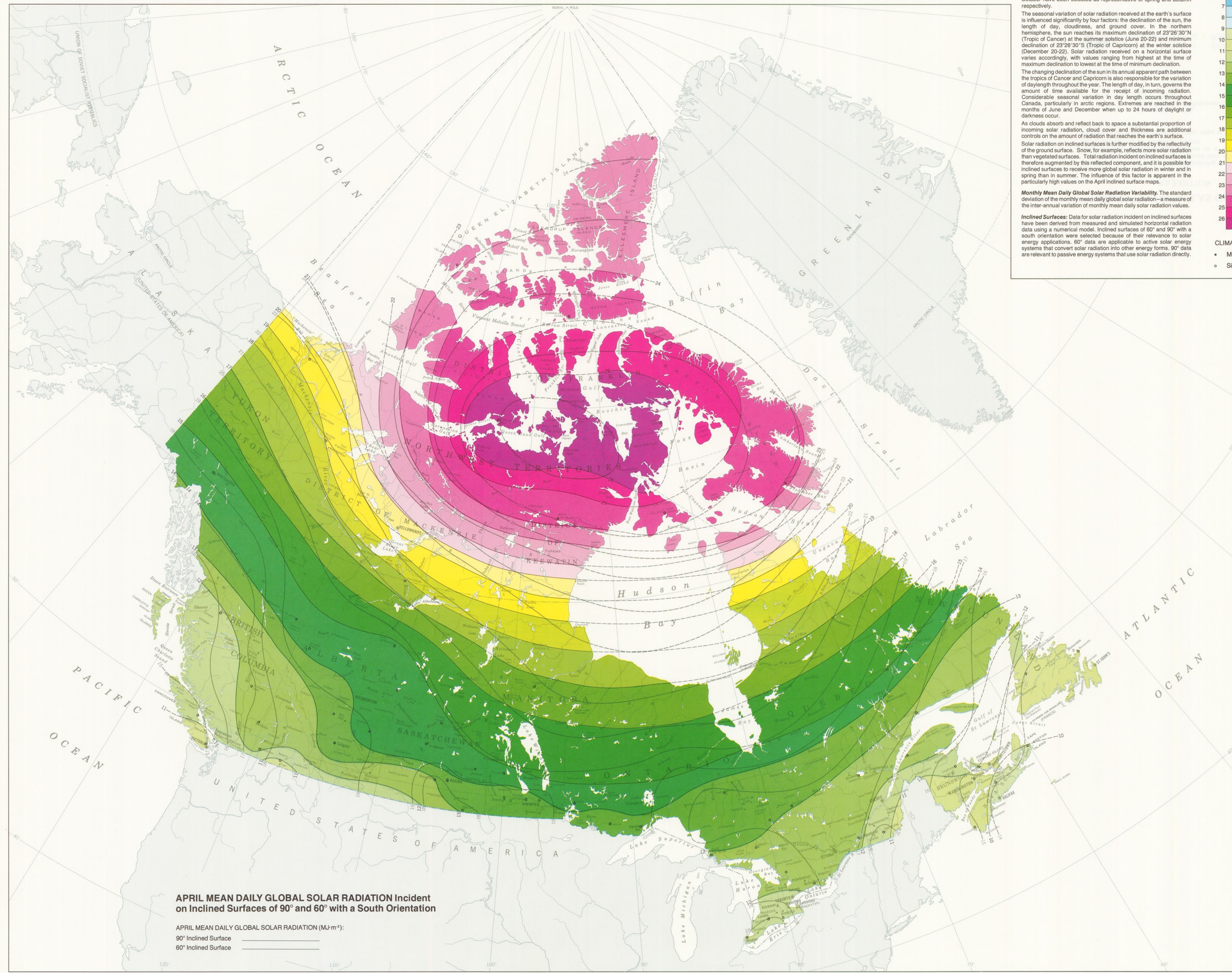
MEGAJULES PER SQUARE METRE (MJ m⁻²)

0	1
2	3
4	5
6	7
8	9
10	11
12	13
14	15
16	17
18	19
20	21
22	23
24	25
26	27
28	29
30	31

CLIMATE STATION

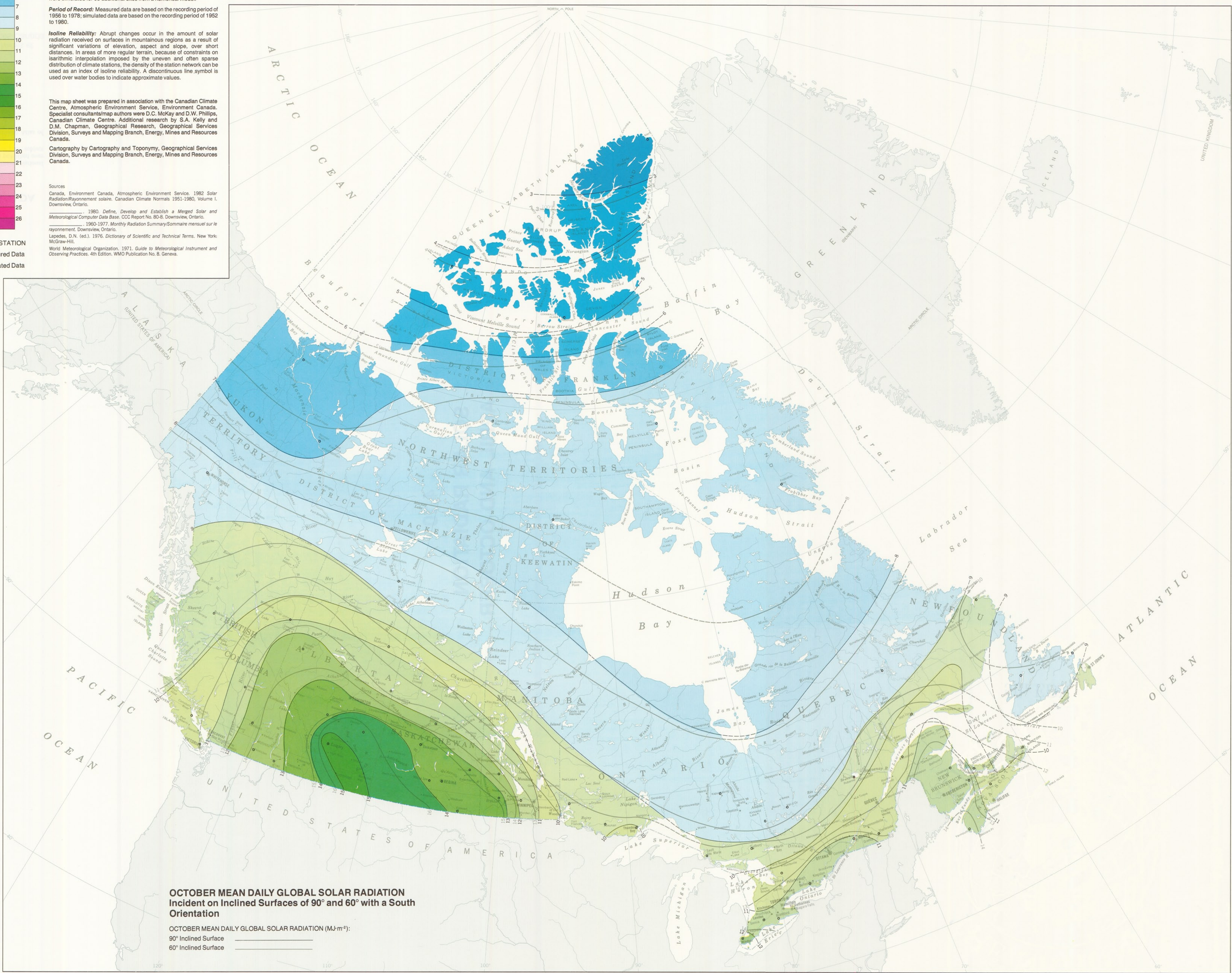
- Measured Data
- Simulated Data

Source: Data: Environment Canada, Atmospheric Environment Service, 1982 Solar Radiation Survey Report, Canadian Climate Centre, 1982. Simulated Data: 1980 Data: Durr, Durr, and Glick, A Simple Solar Radiation Model, Canadian Climate Centre, 1980. Simulated Data: 1980 Data: Durr, Durr, and Glick, A Simple Solar Radiation Model, Canadian Climate Centre, 1980. Simulated Data: 1980 Data: Durr, Durr, and Glick, A Simple Solar Radiation Model, Canadian Climate Centre, 1980.



APRIL MEAN DAILY GLOBAL SOLAR RADIATION Incident on Inclined Surfaces of 90° and 60° with a South Orientation

April Mean Daily Global Solar Radiation (MJ m⁻²)
 90° Inclined Surface
 60° Inclined Surface



OCTOBER MEAN DAILY GLOBAL SOLAR RADIATION Incident on Inclined Surfaces of 90° and 60° with a South Orientation

October Mean Daily Global Solar Radiation (MJ m⁻²)
 90° Inclined Surface
 60° Inclined Surface