

CANADA

SOLAR RADIATION-ANNUAL

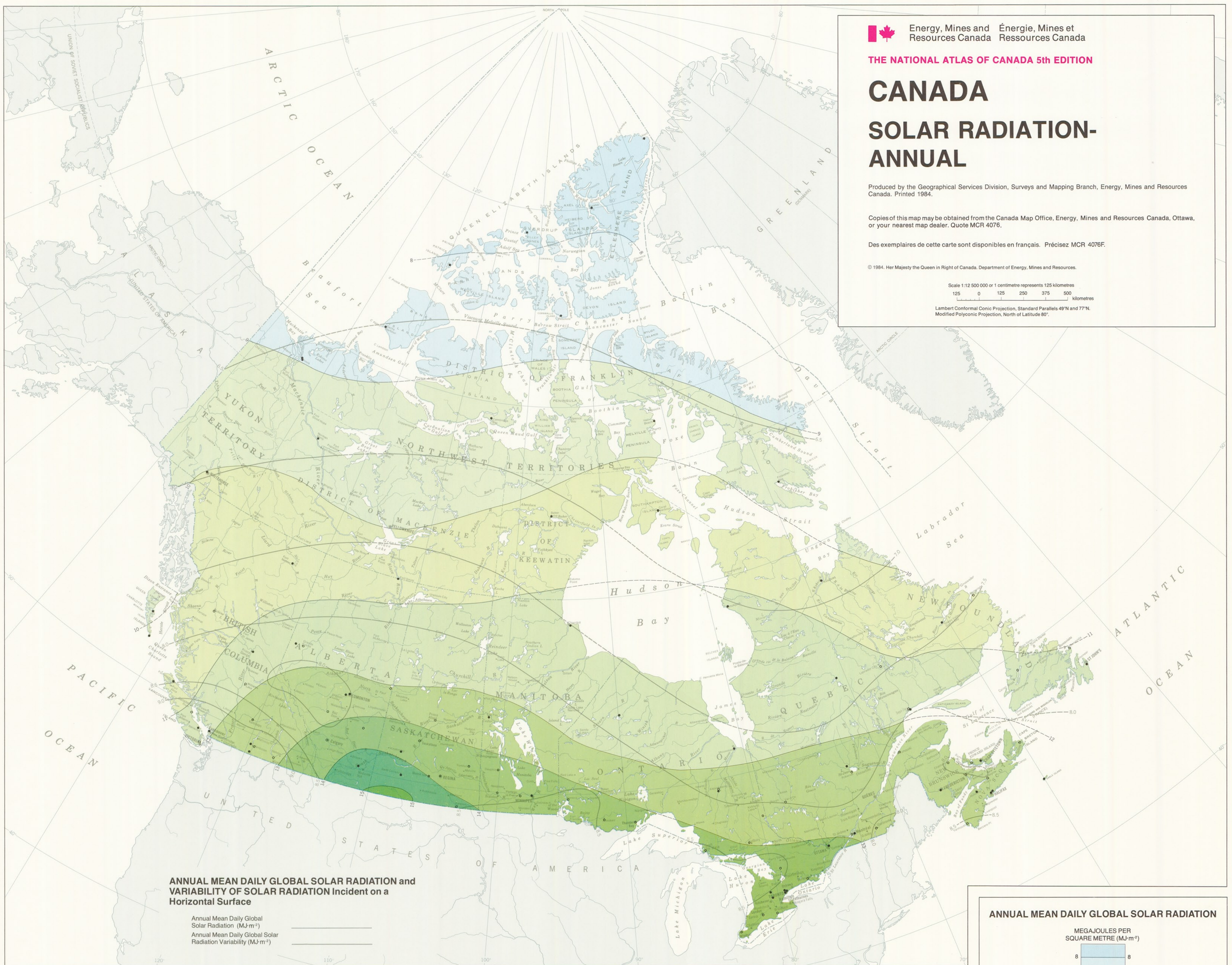
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Scale 1:12 500 000 or 1 centimetre represents 125 kilometres
 125 0 125 250 375 500 Kilometres
 Lambert Conformal Conic Projection, Standard Parallels 49°N and 77°N, Modified Polyconic Projection, North of Latitude 80°.

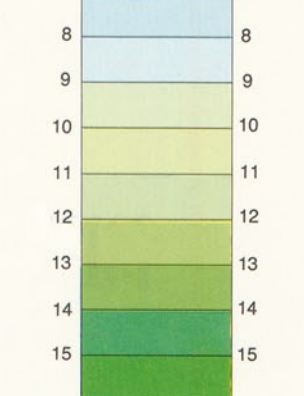


ANNUAL MEAN DAILY GLOBAL SOLAR RADIATION and VARIABILITY OF SOLAR RADIATION Incident on a Horizontal Surface

Annual Mean Daily Global Solar Radiation ($MJ \cdot m^{-2}$)
 Annual Mean Daily Global Solar Radiation Variability ($MJ \cdot m^{-2}$)

ANNUAL MEAN DAILY GLOBAL SOLAR RADIATION

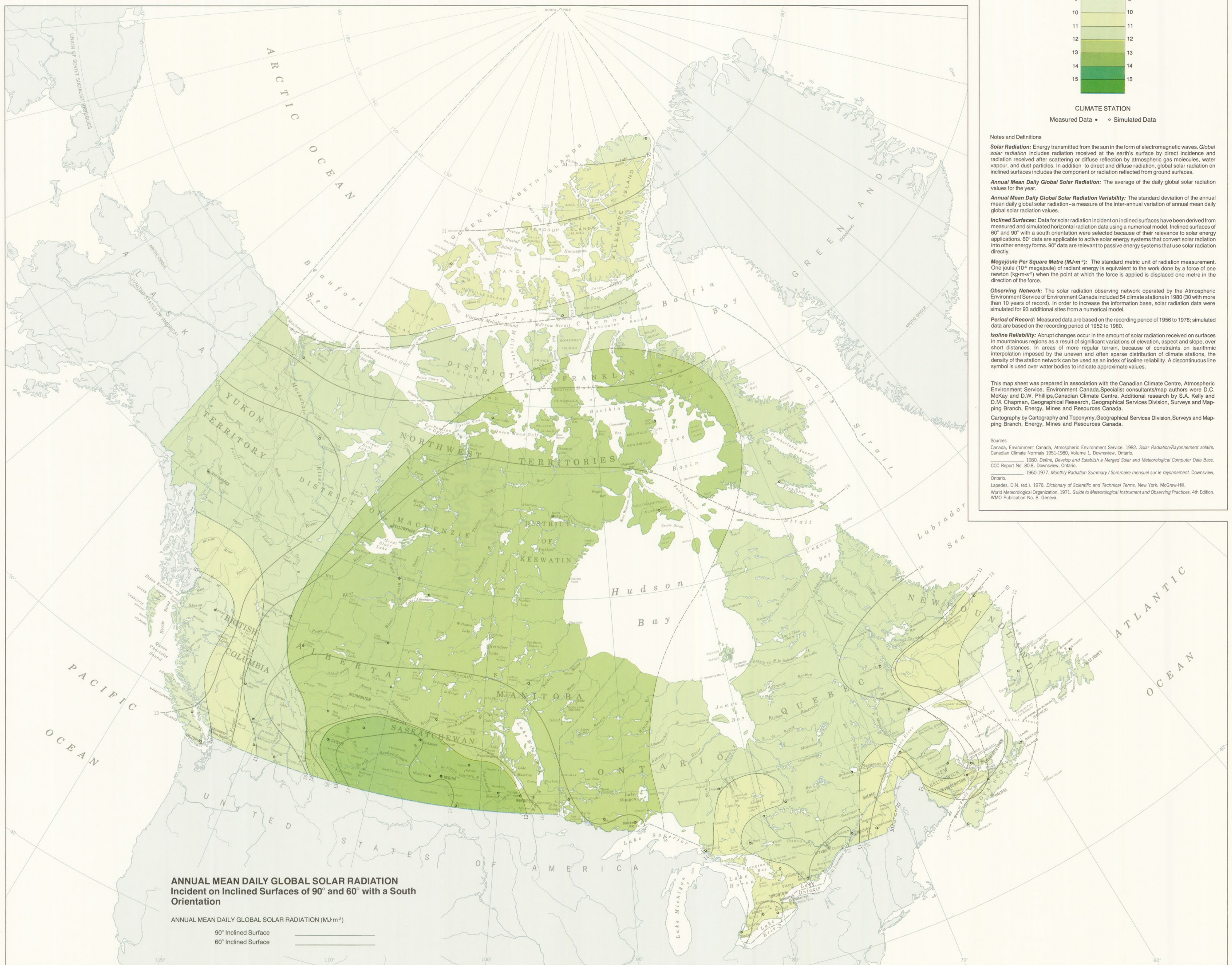
MEGAJouLES PER SQUARE METRE ($MJ \cdot m^{-2}$)



CLIMATE STATION
 Measured Data • Simulated Data

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 after scattering or diffuse reflection by 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.
Annual Mean Daily Global Solar Radiation: The average of the daily global solar radiation values for the year.
Annual Mean Daily Global Solar Radiation Variability: The standard deviation of the annual mean daily global solar radiation—a measure of the inter-annual variation of annual mean daily global solar radiation values.
Inclined Surfaces: Data for solar radiation incident on inclined surfaces have been derived from measured and simulated horizontal radiation data using a numerical model. Inclined surfaces of 60° and 90° with a south orientation were selected because of their relevance to solar energy applications. 60° data are applicable to active solar energy systems that convert solar radiation into other energy forms. 90° data are relevant to passive energy systems that use solar radiation directly.
MegaJoule Per Square Metre ($MJ \cdot m^{-2}$): The standard metric unit of radiation measurement. One joule (10^6 megaJoules) of radiant energy is equivalent to the work done by a force of one newton ($kg \cdot m \cdot s^{-2}$) when the point at which the force is applied is displaced one metre in the direction of the force.
Observing Network: The solar radiation observing network operated by the Atmospheric Environment Service of Environment Canada included 54 climate stations in 1980 (30 with more than 10 years of record). In order to increase the information base, solar radiation data were simulated for 83 additional sites from a numerical model.
Period of Record: Measured data are based on the recording period of 1956 to 1978; simulated data are based on the recording period of 1952 to 1980.
Incline Reliability: Abrupt changes occur in the amount of solar radiation received on surfaces in mountainous regions as a result of significant variations of elevation, aspect and slope, over short distances. In areas of more regular terrain, because of constraints on barometric interpolation imposed by the uneven and often sparse distribution of climate stations, the density of the station network can be used as an index of incline reliability. A discontinuous line symbol is used over water bodies to indicate approximate values.
 This map sheet was prepared in association with the Canadian Climate Centre, Atmospheric Environment Service, Environment Canada. Specialist consultants/ map authors were D.C. McKay and D.W. Phillips/Canadian Climate Centre. Additional research by S.A. Kelly and D.M. Chapman, Geographical Research, Geographical Services Division, Surveys and Mapping Branch, Energy, Mines and Resources Canada.
 Cartography by Cartography and Toponymy, Geographical Services Division, Surveys and Mapping Branch, Energy, Mines and Resources Canada.

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

ANNUAL MEAN DAILY GLOBAL SOLAR RADIATION ($MJ \cdot m^{-2}$)
 90° Inclined Surface
 60° Inclined Surface