

UNIVERSITY OF OREGON SOLAR MONITORING LABORATORY

The University of Oregon (UO) Solar Monitoring Laboratory has been measuring incident solar radiation since 1975. Current support for this work comes from the Regional Solar Radiation Monitoring Project (RSRMP), a utility consortium project including the Bonneville Power Administration (BPA), the Eugene Water and Electric Board (EWEB), and the Northwest Power Planning Council (NPPC) with support from the National Renewable Energy Laboratory (NREL).

This book contains data summaries from the stations in the RSRMP network and data from

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previous solar monitoring efforts. Discussion of the data handling procedures and the accuracy of the data are included in the overview of the solar radiation network at the beginning of this booklet. A summary of the data follows in the form of monthly averaged and long term hourly averaged tables for each site. Archive and summary data files can be downloaded from the UO Solar Monitoring Lab home page at:

<http://solardata.uoregon.edu>

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[†]Solar radiation monitoring has been terminated at these stations.

I. INTRODUCTION

This report presents the summary of solar radiation data collected and analyzed by the UO Solar Monitoring Lab, discusses the accuracy of the data, and reviews the data analysis process. Additionally there is a comparison with data from other geographical areas, and a brief synopsis of our work on empirical correlations.

This data book is separated into chapters that cover four major areas with three appendices. Chapter II starts with an outline of the establishment and growth of the solar monitoring network. The background for the current network and the integration of three independent networks is then described. Chapter III discusses the importance of acquiring a long-term solar radiation database.

The next several chapters combine to explain the data collection procedures and to make relative comparisons between the instrumentation at the monitoring stations. This includes a description of the instruments at each station, a discussion of the data analysis techniques, a review of the importance and accuracy of the calibration process, and finally an explanation of the benefits of strip charts as backup and in analysis of the digitized data.

The impact of the volcanic eruption of El Chichón in Mexico and the possible effects of El Niño on the 1983 data are then examined. Studies on the effects of the 1992 eruption of Mount Pinatubo have not been completed, but are expected to exhibit consequences similar to those of eruption of El Chichón.

The remaining sections before the presentation of the data summaries concern empirical correlations determined for the Pacific Northwest. These correlations are often used as the first step in calculating the amount of solar radiation on a tilted surface. Further information on estimating solar radiation on a tilted surface can be obtained by contacting the University of Oregon Solar Radiation Monitoring Laboratory.

The appendices contain data summaries, plots of daily data, and a table of common conversion factors. Two summary tables of monthly averaged summaries are presented for each type of solar radiation data measured. The first table presents the cumulative hourly average data for each month of the year. The second table contains monthly average solar irradiance values for each month over the period of data collection. Appendix B contains plots of daily data for Burns and Eugene.



Solar Monitoring Station at Eugene, Oregon