

THE EFFECT OF ANTHROPOGENIC ACTIVITY ON SOLAR IRRADIATION IN SAUDI ARABIA

Qassem Y Tarawneh

Prince Sultan Research Center for Environmental, Water and Desert-King Saud University, Saudi Arabia

The Kingdom of Saudi Arabia has witnessed human activity in all aspects of urbanization, industrial, socioeconomic and transportation, all of which depend on fossil fuels. In order to explore the effect of anthropogenic activity on solar irradiation, the concepts of the clearness index (CI), solar irradiation polygons (SIP) and solar Angstrom polygons (SAP) were investigated in this study. The solar irradiation records were grouped into two time periods. The SIPs showed a decline in solar irradiation in the second time period for all regions except the eastern region, which reflect general warming in the country. The maximum difference between the time periods, of approximately 10.9 (MJ/m²/day), is found in Oct' at Alhefa station in the Southwestern region, while at Khurais station in the Eastern region the values of solar irradiation are very close together, within 2 (MJ/m²/day). On the other hand, some of the climate indices are summer days tropical nights, percentiles of maximum temperature all of which shows general warming. Finally, solar irradiation and climate indicators showed that there is general warming, which strongly indicates anthropogenic factors are at play.

qassemtarawneh@yahoo.com