High resolution climatology
- towards climate change services

The SunCloud project: An initiative for a development of a worldwide sunshine duration and cloudiness observations dataset

A. Sanchez-Lorenzo (1,2) and the SunCloud Team

(1) Institute for Atmospheric and Climate Science, ETH Zurich, (2) Barcelona Science Park, Barcelona, Spain (asanchezl@pcb.ub.cat)

One problem encountered when establishing the causes of global dimming and brightening is the limited number of long-term solar radiation series with accurate and calibrated measurements. For this reason, the analysis is often supported and extended with the use of other climatic variables such as sunshine duration and cloud cover. Specifically, sunshine duration is defined as the amount of time usually expressed in hours that direct solar radiation exceeds a certain threshold (usually taken at 120 W m-2). Consequently, this variable can be considered as an excellent proxy measure of solar radiation at interannual and decadal time scales, with the advantage that measurements of this variable were initiated in the late 19th century in different, worldwide, main meteorological stations. Nevertheless, detailed and up-to-date analysis of sunshine duration behavior on global or hemispheric scales are still missing.

Thus, starting on September 2010 in the framework of different research projects, we will engage a worldwide compilation of the longest daily or monthly sunshine duration series from the late 19th century until present. Several quality control checks and homogenization methods will be applied to the generated sunshine dataset. The relationship between the more precise downward solar radiation series from the Global Energy Balance Archive (GEBA) and the homogenized sunshine series will be studied in order to reconstruct global and regional solar irradiance at the Earth's surface since the late 19th century. Since clouds are the main cause of interannual and decadal variability of radiation reaching the Earth's surface, as a complement to the long-term sunshine series we will also compile worldwide surface cloudiness observations.

With this presentation we seek to encourage the climate community to contribute with their own local datasets to the SunCloud project.

The SunCloud Team:

M. Wild, Institute for Atmospheric and Climate Science, ETH Zurich, Switzerland (martin.wild@env.ethz.ch)

E. Pallé, Institute of Astrophysics of the Canary Islands, Spain (epalle@iac.es)

J. Calbó, Group of Environmental Physics, University of Girona, Spain (josep.calbo@udg.edu)

M. Brunetti, Institute of Atmospheric Sciences and Climate, Italian National Research Council, Italy (m.brunetti@isac.cnr.it)

G. Stanhill, Department of Environmental Physics and Irrigation, The Volcani Center, Israel (gerald@volcani.agri.gov.il)

R. Brázdil, Institute of Geography, Masaryk University, Czech Republic (brazdil@sci.muni.cz)

M. Barriendos, Department of Modern History, University of Barcelona, Spain (mbarriendos@ub.edu)

C. Deser, National Center for Atmospheric Research, USA (cdeser@ucar.edu)

P. Pereira, Department of Environmental Protection, Vilnius Gediminas Technical University, Lithuania (pereiraub@gmail.com)

C. Azorin-Molina, The CEAM Foundation (Fundación Centro de Estudios Ambientales del Mediterráneo), Spain (cazorin@ceam.es)

Q. You, Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China (yqingl@126.com)