The Baseline Surface Radiation Network: Surface Radiation Observations for Climate Research

C. Long[1,2], J. Michalsky[1,2] and G. König-Langlo[3]

[1]Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO 80309; 303-497-6056, E-mail: chuck.long@noaa.gov
[2]NOAA Earth System Research Laboratory, Global Monitoring Division, Boulder, CO 80305
[3]World Radiation Monitoring Centre at the Alfred Wegener Institute, Bremerhaven, Germany

The radiation budget of the Earth-atmosphere system plays a fundamental role in determining the thermal conditions and the circulation of the atmosphere and the ocean, shaping the main characteristics of the Earth's climate. Irradiances at the Earth's surface are especially important in understanding the climate processes, since the Earth's surface transforms approximately 60% of the solar radiation absorbed by the planet. The Baseline Surface Radiation Network (BSRN) is a project of the Global Energy and Water Cycle Experiment (GEWEX) Data Assimilation Panel (GDAP) under the umbrella of the World Climate Research Programme (WCRP) of the World Meteorological Organization (WMO). The BSRN network is aimed at providing high quality long-term surface radiative energy budget observations for detecting important changes in the radiation field at the Earth's surface which may be related to climate changes. In 2004, the BSRN was designated as the global baseline network for surface radiation for the Global Climate Observing System (GCOS), and the BSRN stations also contribute to the Global Atmospheric Watch (GAW). Currently the BSRN is comprised of 58 stations in contrasting climatic zones, covering a latitude range from 80°N to 90°S and as of the end of 2014 has produced 8000 monthly datasets available from the BSRN Archive. The NOAA ESRL Global Monitoring Division contributes data from 13 sites, thus constituting the largest contributor to the BSRN network. This presentation will give an overview of the BSRN effort, including sites, operational specifications, scientific advances, and current status and future plans.

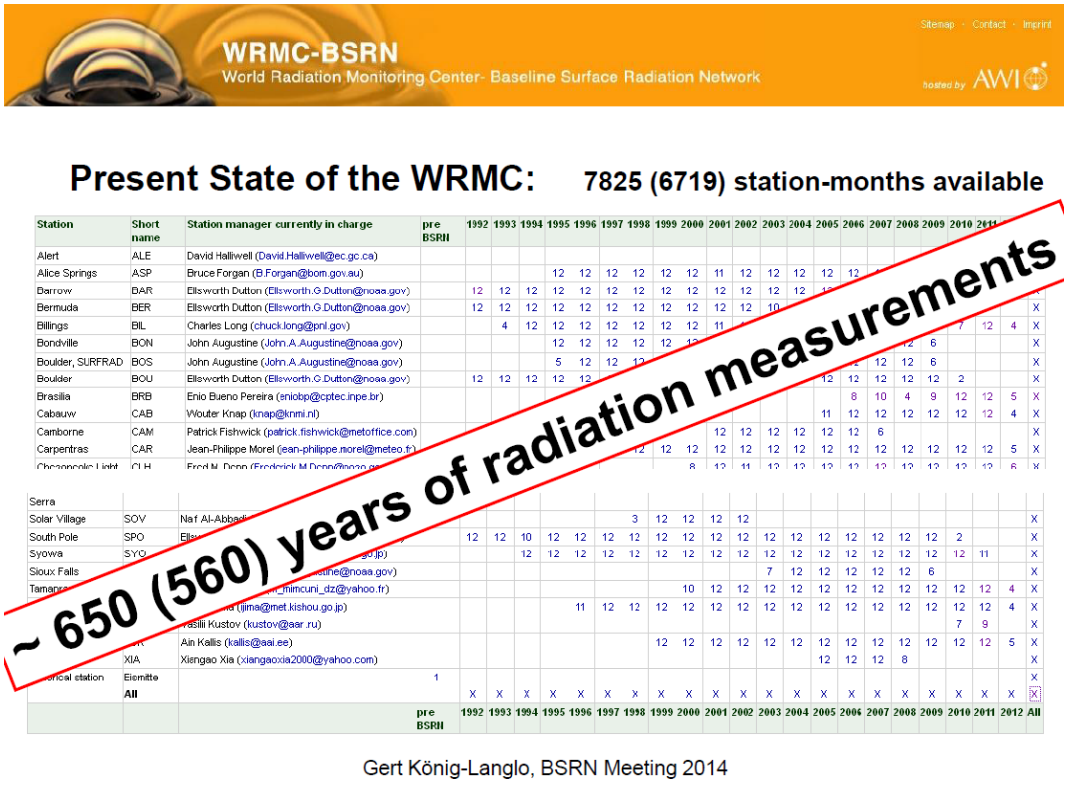

Figure 1. As of the end of 2014, the BSRN Archive houses 650 years' worth of data in monthly station data files from the 58 sites making up the network. This is a 90 data-year increase over the previous year-end total.