Dear BAMS Editorial Board,

Our proposed article describes the Total Solar Irradiance and Solar Spectral Irradiance Climate Data Records (CDRs) that we have recently developed and transitioned to NOAA as part of its Climate Data Record program. The new climate data records specify the total and spectral solar irradiance, with uncertainties, daily and monthly from 1882 and annually from 1610 to present day, with quarterly updates. Derived from extant solar irradiance databases, the CDRs are pertinent to a broad collection of user groups that span the general BAMS readership, including the global, regional, and atmospheric chemistry and climate modeling communities, the renewable energy and water resource industries, and divisions of the federal and state governments such as NASA and NOAA.

For example, models of atmospheric and climate change, including those used in past IPCC reports, require specification of the top-of-atmosphere total and spectrally resolved solar irradiance over a wide range of time scales. Solar irradiance models are needed to provide these constraints as current satellite records of total solar irradiance (TSI; ~36 years) and spectral solar irradiance (SSI; ~10 years) lack the length and, with respect to SSI, the stability to resolve solar variability over multiple 11-year solar activity cycles. Currently, one source of controversy is how solar spectral irradiance varies during the solar cycle, and the implications for the spectral dispensation of the energy across the layers of Earth’s atmosphere and how this impacts chemistry and climate. We briefly discuss issues such as this in the context of the new solar irradiance CDRs.

We expect the article to be on the order of 15 pages with approximately 10 color figures. No electronic supplements are anticipated.

We hope our proposed article will be suitable for publication in BAMS.

Sincerely,

Odele Coddington, with co-authors Judith Lean, Peter Pilewskie, Martin Snow, and Doug Lindholm.