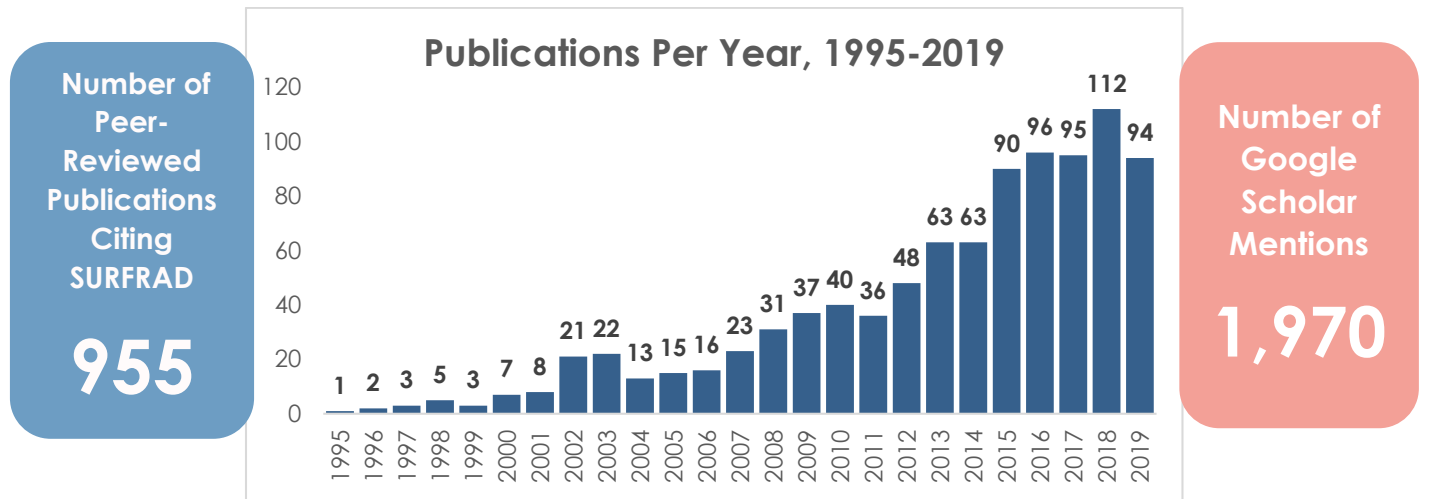# SURFRAD Impact Analysis

SURFRAD (The Surface Radiation Budget Network) supports climate research with accurate, continuous, long-term measurements of the surface radiation budget over the US. Established in 1995, the network consists of seven climatologically diverse observation stations providing ground-based measurements. In addition, SURFRAD observations are used to evaluate satellite-based products and to validate hydrologic, weather prediction, and climate models. Measurements of variables that affect radiative transfer such as aerosol optical depth, cloud images, cloud fraction, and cloud-base height are also made to aid research. SURFRAD data are quality-controlled and uploaded to anonymous FTP on a daily basis.
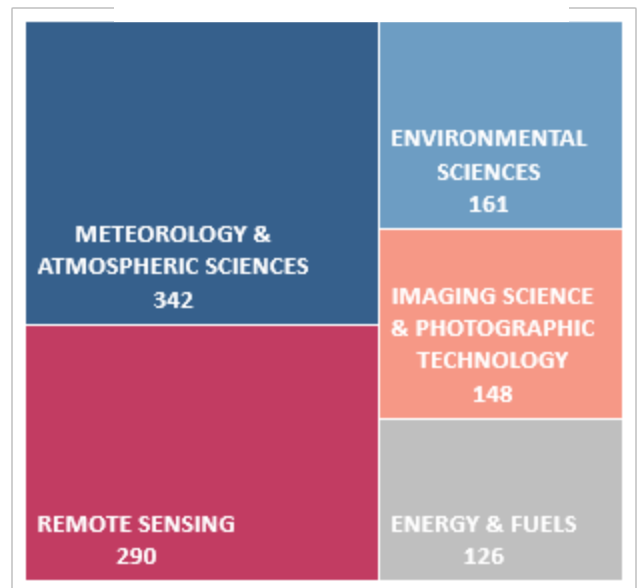
This citation analysis illustrates the research value and widespread applications of SURFRAD products.

Number of Peer-Reviewed Publications Citing SURFRAD

955

Publications Per Year, 1995-2019

Number of Google Scholar Mentions

1,970

Top 5 Subject Areas

Broad application: In addition to the expected subject areas in atmospheric sciences, SURFRAD is cited in a broad range of topics including:

- Agriculture (pest damage/herbivory; nutrient response to runoff; agricultural yield)
- Renewable & sustainable energy (wind & solar forecasting; demand loads; biofuels productivity)
- Commercial building design & energy use patterns
- Outdoor materials degradation & weathering
- Toxicology (phototoxicity in marine species)
- Novel food sources (microalgae)
- Human health (melanoma)

METEOROLOGY & ATMOSPHERIC SCIENCES
342

ENVIRONMENTAL SCIENCES
161

IMAGING SCIENCE & PHOTOGRAPHIC TECHNOLOGY
148

REMOTE SENSING
290

ENERGY & FUELS
126

Prepared by Boulder Labs Library, April 2020

High-impact journals: SURFRAD has been cited in prestigious journals including:

- *Bulletin of the American Meteorological Society*
- *Earth Systems Science Data*
- *Nature Communications*
- *Nature Energy*
- *Proceedings of the National Academy of Sciences*
- *Progress in Energy & Combustion Science*
- *Remote Sensing of the Environment*
- *Renewable & Sustainable Energy Reviews*
- *Science*

NOAA-Authored Publications in the Top 10 Cited Papers	Number of Citations
Mitchell, K. E., et al. (2004), The multi-institution North American Land Data Assimilation System (NLDAS): Utilizing multiple GCIP products and partners in a continental distributed hydrological modeling system. *J. Geophys. Res.* 109, D07S90.	**692**
Ohmura, A., et al. (1998), Baseline Surface Radiation Network (BSRN/WCRP): New precision radiometry for climate research. *Bull. Amer. Meteor. Soc.* 79(10):2115–2136.	**596**
Cosgrove, B. A., et al. (2003), Real-time and retrospective forcing in the North American Land Data Assimilation System (NLDAS) project. *J. Geophys. Res.* 108(D22), 8842.	**416**

Types of Organizations Citing SURFRAD
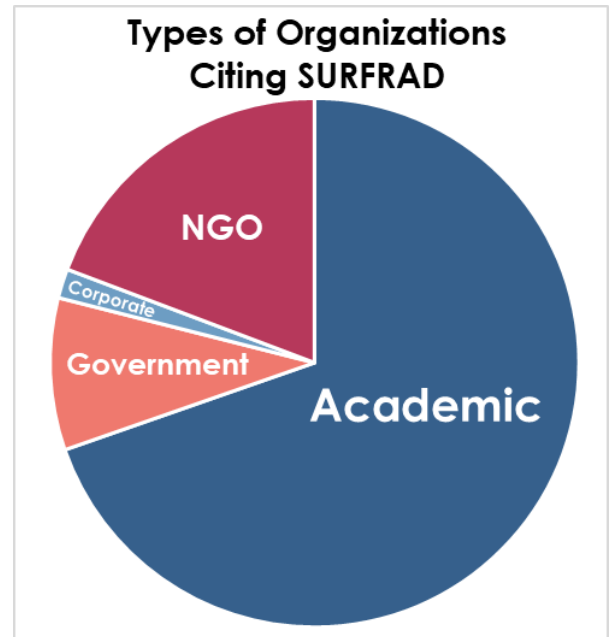
Data Sources and Methodology

Searches were conducted in Web of Science (WoS) and Google Scholar (GS). In March 2020, a GS search on the term "SURFRAD" returned 1,970 records. Of these, 955 were found in WoS. Document types indexed in GS that are NOT indexed in WoS include dissertations and theses, technical reports, conference abstracts, posters, presentations, and more. Because GS is an uncurated database, the quality of search returns is difficult to verify. However, it can be assumed that SURFRAD data make a valuable contribution to research products well beyond the publications indexed in WoS.

All publication data (such as citation counts, publications per year, etc.) are based on the WoS results. Due to lag times in database updates, 2019 data may be incomplete. Additional information on search terms and strategy is available on request from the Boulder Labs Library, BoulderLabs.Ref@noaa.gov.

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