

# Surface Radiation

## Budget

ESSENTIAL CLIMATE VARIABLE (ECV)  
FACTSHEET



GLOBAL CLIMATE  
OBSERVING SYSTEM  
KEEPING WATCH OVER OUR CLIMATE



### ECV IN BRIEF

**Domain:** Atmosphere  
**Subdomain:** Surface  
**Scientific Area:** Energy and Temperature  
**ECV Stewards:** Rainer Hollmann  
**Products:** Surface ERB longwave,  
Surface ERB shortwave



### Surface Radiation Budget

The Surface Radiation Budget is a fundamental component of the surface energy budget that is crucial to nearly all aspects of climate, and needs to be monitored systematically.

### ECV Product<sup>1</sup>

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQ.	RES.	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/ REFERENCES
Surface ERB longwave	Flux density of radiation emitted by the gases, aerosols and clouds of the atmosphere to the Earth's surface (W/m <sup>2</sup> )	Monthly (resolving diurnal cycle)	100km/N A	Requirements on global mean: 1W/m <sup>2</sup>	0.2W/m <sup>2</sup> /decade	
Surface ERB shortwave	Flux density of the solar radiation at the Earth's surface (W/m <sup>2</sup> )	Monthly (resolving diurnal cycle)	100km/N A	Requirements on global mean: 1W/m <sup>2</sup>	0.2W/m <sup>2</sup> /decade	

### Data Sources<sup>2</sup>

#### In Situ Data:

- ▶ World Radiation Data Centre (WRDC)  
<http://wrdc.mgo.rssi.ru/>

<sup>1</sup> Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: [gcos.wmo.int](http://gcos.wmo.int) and [climatedata.wmo.int](http://climatedata.wmo.int).

<sup>2</sup> This list provides sources for openly accessible data sets with worldwide coverage for which metadata is available. It is curated by the respective GCOS ECV Steward(s). The list does not claim to be complete. Anyone with a suitable dataset who would like it to be added to this list should contact GCOS.



- ▶ World Radiation Monitoring Center (WRMC), the central archive of the Baseline Surface Radiation Network (BSRN)  
<http://bsrn.awi.de/>

**Reanalysis:**

- ▶ REANALYSES.ORG (Inventory for Reanalysis)  
<http://reanalyses.org>

**Satellite:**

- ▶ Satellite ECV Inventory by the CEOS/CGMS Working Group on Climate (WGClimate)  
<http://climatemonitoring.info/ecvinventory>



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