

Lightning

ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET



ECV IN BRIEF

- Domain:** Atmosphere
- Subdomain:** Upper Atmosphere
- Scientific Area:** Physical Properties
- ECV Stewards:** Robert Holzworth
- Products:** Number of lightnings



Lightning

Lightning is one of the most dramatic weather phenomena, causing many fatalities as well as substantial loss and damage for example by forest fires, damage to electrical infrastructure and other sectors every year all over the world. On top, even more damage is caused by the storms which generate lightning. This direct link to convection makes lightning also a potentially valuable indicator to track and understand trends in storminess, particularly under climate variability and change. In addition, lightning itself impacts the global climate by producing nitrogen oxides (NO_x), a strong greenhouse gas.

ECV Product¹

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQ.	RES.	REQ. MEAS. UNCERT.	STAB.	STANDARDS/ REFERENCES
Number of lightnings	Total number of detected strokes in the corresponding time interval and the space unit. The space unit (grid box) should be equal to the horizontal resolution and the accumulation time to the observing cycle.	1 day	10km			MTG EURD[1]

¹ 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 and climatedata.wmo.int.

Data Sources²

Gridded In Situ Data::

- ▶ World Wide Lightning Location Network (WWLLN)
<http://wwlln.net/>

Global Lightning Distribution

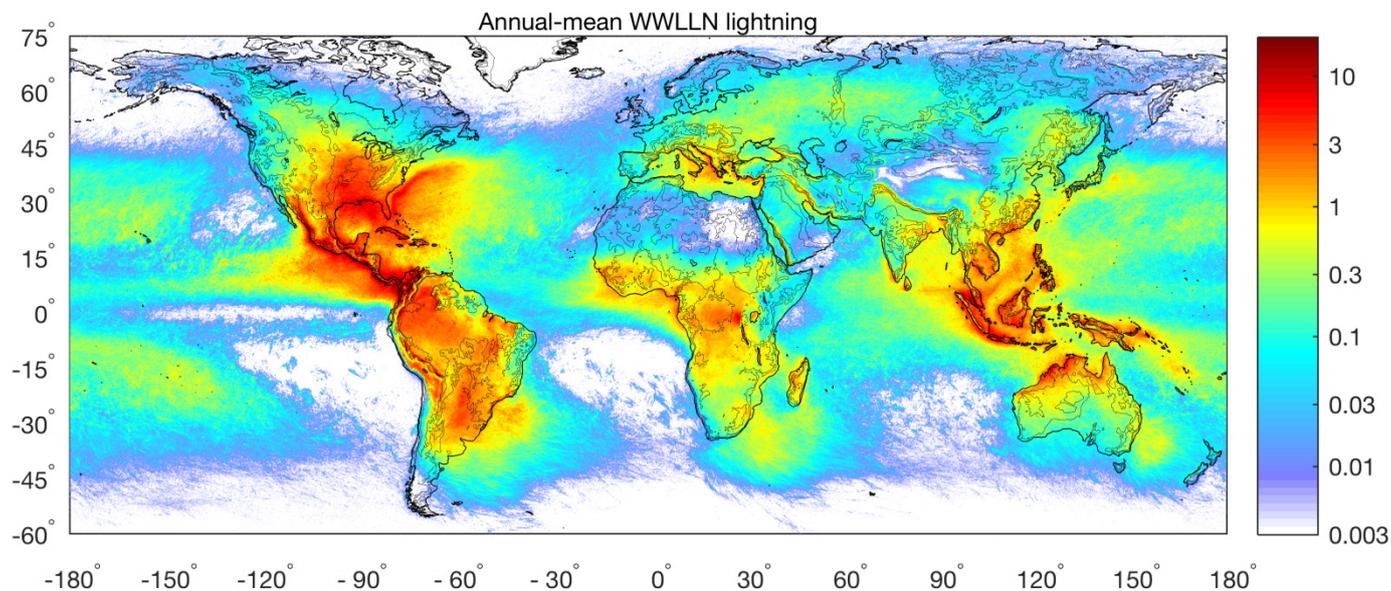


Figure: Number of lightning strokes accumulated for the years 2008–2017, presented as strokes per year per square kilometer on a $0.1^\circ \times 0.1^\circ$ global grid.

Source: Data are from the World Wide Lightning Location Network, and the map is an upgrade of the $0.25^\circ \times 0.25^\circ$ global climatology published by Virts et al. [2013].

² 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.



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