

README: WWLLN GLOBAL STROKE DENSITY TIME SERIES

Basic information

This stroke density dataset is based on lightning observations from the World-Wide Lightning Location Network ([WWLLN](#)). The data are provided at 1° and 0.1° latitude/longitude resolution.

The following processing is applied to the stroke data:

- **Buddy-checking:** From 2 February 2015 onward, the WWLLN processing system has applied buddy-checking to reduce noise. Strokes detected by only 5 or 6 stations are matched to “buddy” strokes located by 6 or more stations within the previous 60 minutes and +/-0.75 latitude/longitude. If no “buddy” is found, the stroke is discarded. For this dataset, buddy-checking has also been applied to WWLLN data prior to 2 February 2015.
- **De-duplication:** Duplicates strokes occur when the WWLLN processing system receives sufficient wave packets to locate a stroke, pauses to calculate the location, and then receives additional wave packets such that the stroke is recorded again. The result is a duplicate stroke that is very close in space and time. For this dataset, for strokes within 50 μ s and 15 km of each other, the stroke that is located by fewer stations or with a later timestamp is discarded.

File name convention

- *WWLLN_sd_?d_????.nc*: Monthly lightning frequency of occurrence during the indicated year.
- Files with names including *_ld_* and *_td_* are at 1° and 0.1° latitude/longitude resolution, respectively.

File contents

WWLLN_sd_?d_????.nc

- *lat(nlat)*: Latitude coordinates for center of grid boxes.
- *lon(nlon)*: Longitude coordinates for center of grid boxes.
- *stroke_density(nmon,nlat,nlon)*: Frequency of occurrence of lightning at indicated location for each month. Units are strokes $\text{km}^{-2} \text{yr}^{-1}$.
- *mon(nmon)*: Month (1 = January, 2 = February, etc.). Lightning associated with January is summed from 01 January to 31 January.